

DRAFT
Field Observations Report
Colstrip Steam Electric Station
Colstrip, Montana
August 31 – September 3, 2009

Prepared for:

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, DC 20460



November 2009

Science Applications International Corporation (SAIC)
12100 Sunset Hills Road
Reston, VA 20190



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EPA Contract: EP-W-04-046
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APPENDIX E: CHAIN OF CUSTODY FORMS

APPENDIX F: LAB RESULTS

APPENDIX G: COMPLETE LAB DATA PACKAGE

Facility Name: Colstrip Steam Electric Station

Facility Address: 580 Willow Avenue
PO Box 38
Colstrip, Montana 59323

Facility Owner/Operator: PPL Montana, LLC (Owns 50% of Unit 1, 50% of Unit 2, 30% of Unit 3)

Owner/Operator Address: 303 North Broadway, Suite 400
Billings, Montana 59101

Additional Facility Owners: Puget Sound Energy, Inc. (Owns 50% of Unit 1, 50% of Unit 2, 25% of Unit 3, 25% of Unit 4)

Avista Corporation (Owns 15% of Unit 3, 15% of Unit 4)

Portland General Electric Company (Owns 20% of Unit 3, 20% of Unit 4)

NorthWestern Energy (Owns 30% of Unit 4)

PacifiCorp (Owns 10% of Unit 3, 10% of Unit 4)

Additional Facility Owners' Addresses: Puget Sound Energy, Inc.
PO Box 97034, PSE-12S
Bellevue, WA 98009-9734

Avista Corporation
1411 E Mission, MSC-7
Spokane, WA 99220

Portland General Electric Company
121 SW Salmon St.
Portland, OR 97204

NorthWestern Energy
40 E. Broadway
Butte, MT 59701

PacifiCorp
1407 West North Temple
Salt Lake City, UT 84116

Dates of Inspection/Sampling: August 31 – September 3, 2009

Inspectors:

Felix Flechas, EPA Region 8 (Lead)
Craig Haas, EPA Headquarters
David Rise, EPA Region 8 (CWA)
Jerry Whittum, SAIC
Brandon Peebles, SAIC

Point of Contact:

Gordon Criswell, Environmental Manager,
Colstrip Steam Electric Station

1.0 Introduction

The Waste & Chemical Enforcement Division (WCED), Office of Civil Enforcement, in conjunction with the Office of Compliance and Environmental Protection Agency (EPA) Regions, has initiated an exploratory effort to investigate the extent to which companies in a variety of sectors may have engaged in the illegal disposal of hazardous waste in surface impoundments. This effort is consistent with WCED's goal to target and develop enforcement actions under the Resource Conservation and Recovery Act (RCRA), the Emergency Planning and Community Right-to-Know Act (EPCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), against persons engaged in significant non-compliance that substantially affects human health or the environment. WCED needs to gather and assess information related to surface impoundments; target facilities with surface impoundments based on risk and other factors; inspect and investigate activities at targeted facilities; develop enforcement actions as appropriate; and assess the data and other information gathered through these efforts.

2.0 Background***2.1 Purpose***

EPA inspected the Colstrip Steam Electric Station (Colstrip) coal-fired power plant the week of August 31, 2009 to determine compliance with applicable regulations under RCRA, Clean Water Act (CWA), EPCRA, and other statutes. The previous week, EPA provided notice of the inspection to Colstrip and submitted lists of required documents and sample containers necessary if Colstrip wished to split samples. The investigation focused on determining what types of wastes are generated, how the wastes are managed, and how the wastes are disposed. Science Applications International Corporation (SAIC) was tasked with assisting in the investigation by providing technical support for EPA, and also tasked with preparing for and collecting water and soil samples at the facility. These samples were analyzed for compliance with RCRA, CWA, and other relevant statutes. This report summarizes the activities performed by SAIC in support of EPA. Information in this report is based on interviews with Colstrip personnel, site observations, and review of documents provided by Colstrip. Other sources of information are noted where applicable.

2.2 Site and Process Description

The Colstrip Steam Electric Station is jointly owned by PPL Montana, LLC, NorthWestern Energy, Puget Sound Energy, Inc., Portland General Electric Company, Avista Corporation, and PacifiCorp, and is operated by PPL Montana. The Colstrip Steam Electric Station (Colstrip) is located in Colstrip, Montana, 100 miles east of Billings, in Rosebud County. Figure 2-1 is an

overhead photo of the plant site. Colstrip operates 24 hours per day, 7 days per week with about 350 employees. Colstrip consists of four coal-fired power plant units that have a generating capacity of 2,094 megawatts (MW) of electricity. Table 2-1 describes the power generating units at Colstrip. Units 1 and 2 utilize an average of 2.8 million tons of coal per year, while Units 3 and 4 utilize 6.4 million tons per year. The Colstrip plant receives coal from the Rosebud Mine located within 10 miles of the plant. The sub-bituminous coal is mined, owned, and supplied by Western Energy Company. Coal for Units 1 and 2 is received at Western Energy's No. 6 lowering well. The coal is conveyed to a surge pile serving the units and then conveyed into Units 1 and 2. After the coal is conveyed into the units, it is distributed into coal silos and fed into pulverizers. The pulverizers grind the coal and then it is blown into the Unit 1 and 2 boilers. Coal for Units 3 and 4 is received from Western Energy's conveyor. The conveyor is a four-mile, covered, overland system that travels from the mine. The coal is conveyed to the Area C transfer house and then to the coal barn. From the coal barn, the coal is conveyed into Units 3 and 4 where it is distributed into coal silos and fed into pulverizers. Just as in Units 1 and 2, the pulverizers grind the coal and it is then blown into the Unit 3 and 4 boilers. Once the coal is blown in the boilers, it is burned and releases its energy as heat. Water absorbs the energy through the boiler tubes, thus turning the water into steam. The steam strikes the blades of the turbines, which drives the turbine generator. The turbine generator produces the electricity. At the time of the inspection, Unit 4 was not in service due to repairs. According to the Colstrip representatives, the unit will be returned to service in the near future.

Table 2-1. Colstrip Generating Units

Unit Number	Size (MW)	Began Operation	Fuel	Burner Type	Particulate Control	NOx Control	SO₂ Control
1	307	November 15, 1975	Sub-Bituminous coal from the Rosebud Seam	Tangentially fired	Wet venturi scrubber	Wet venturi scrubber	Wet venturi scrubber
2	307	August 20, 1976	Sub-Bituminous coal from the Rosebud Seam	Tangentially fired	Wet venturi scrubber	Wet venturi scrubber	Wet venturi scrubber
3	740	January 10, 1984	Sub-Bituminous coal from the Rosebud Seam	Tangentially fired	Wet venturi scrubber	Wet venturi scrubber	Wet venturi scrubber
4	740	April 1, 1986	Sub-Bituminous coal from the Rosebud Seam	Tangentially fired	Wet venturi scrubber	Wet venturi scrubber	Wet venturi scrubber

*Most of the information in the above table was received from a Colstrip representative post-inspection.



Figure 2-1. Aerial View of Colstrip Steam Electric Station

2.3 *Major Raw Materials and Waste Streams*

Colstrip utilizes coal, fuel oil, lime, boiler chemicals, and cooling tower chemicals in the process of generating electricity. Coal is used to fuel the boilers. The four units receive coal that is pulverized and fed into boilers where it is combusted to create heat in the fireside of the boiler. Water in tubes on the outside of the boiler (waterside) exchanges heat from the fireside and boils to form steam. The steam propels turbine blades used to generate electricity. Wet scrubbers are utilized for particulate control, NO_x control, and SO₂ removal. The chemical additive used for emission control is lime. The lime feed system is on Units 3 and 4, while Units 1 and 2 do not normally need lime. However, if Units 1 and 2 possess low ash alkalinity or high sulfur coal, lime is added from the feed system on Units 3 and 4. The lime system slakes high calcium lime and dilutes it to lime slurry. The slurry is added to the wet scrubbers to assist in SO₂ removal. The calcium oxide from the lime slurry reacts with the SO₂ in the flue gas, thus forming calcium sulfate. The calcium sulfate is captured in the wet scrubbers and is disposed of in the ash impoundment. The ash impoundment water is reused in the scrubbers.

Table 2-2. Colstrip Raw Materials Used

Raw Material	2008 Usage	Purpose
Coal	10,346,274 tons	Fuel
Lime	62,678.3 tons	Flue Gas Desulfurization (FGD)
Diesel fuel	321,523 gallons	Fuel
Gasoline	44,102 gallons	Fuel
Sulfuric acid	12,329,726 lbs	Demineralizer regeneration, pH control
Sodium Hydroxide	1,029,960 lbs	Demineralizer regeneration
Turbine Lube Oil	3,960 gallons	Lubrication
Salt (NaCl ₂)	1,798,020 lbs	Bleach generator; Cooling Water Bio-control
Bleach (12% Sodium Hypochlorite in water)	762,449 lbs	Cooling Water Bio-control
Ethylene Control	70,300 lbs	Building heating
CO ₂	131,240 gallons	Fire suppressant; Generator purging
Nalco Ferralyte 8131	41,009 lbs	Water treatment
Nalco 3DT187	232,030 lbs	Water treatment
Nalco 73199	81,011 lbs	Water treatment
Nalco 1318	306,229 lbs	Water treatment
Nalco 3DT179	41,257 lbs	Bottom ash
Nalco 73550	34,223 lbs	Water treatment
Nalco 71D5-Plus	11,197 lbs	Water treatment
Nalco 8338	18,013 lbs	Water treatment
Nalco PC-191	28,038 lbs	Water treatment
Nalco 8131	41,009 lbs	Water treatment
Nalco TX 13757	11,844 lbs	Water treatment
Nalco 9211	83,479 lbs	Coal handling dust suppression
Dustfoam	488,932 lbs	Coal handling dust suppression
Dustcon	38,392 lbs	Coal handling dust suppression
Sodium Metabisulfite (30% in water)	2,356 gallons	Water treatment
Nalco 19H	3,789 lbs	Water treatment
Nalco Y300476	1,412 lbs	Water treatment

Bottom ash and fly ash are two of the largest waste streams and are Bevill-exempt RCRA wastes. The material is pumped as a slurry to the final disposal pond. The water is then decanted and returned to the units for reuse. Coal pile run-off is also a Bevill-exempt waste; it is collected and stored in on-site ponds lined with clay or synthetic liners.

Non-uniquely associated wastes include cooling tower blowdown, wastewater from demineralizer backwash, bearing cooling water, boiler and evaporative blowdown, Reverse Osmosis reject water, and wastewater from floor and roof drains.

Table 2-3. Colstrip Waste Streams

Material	Annual Volume*	Final Disposition
1 & 2 Cooling Tower Blowdown (Yellowstone River water concentrated ~15 times)	164 million gallons	1 & 2 Stage II Evaporation Pond (STEP)
1 & 2 Flyash/FGD Material	175,000 tons	1 & 2 STEP
1 & 2 Bottom Ash (includes <0.1% mill rejects)	80,000 tons	3 & 4 Effluent Holding Pond (EHP)/Beneficial Use
3 & 4 Cooling Tower Blowdown (Yellowstone River water concentrated ~15 times)	350 million gallons	3 & 4 EHP
3 & 4 Flyash/FGD material	650,000 tons	3 & 4 EHP
3 & 4 Bottom Ash (includes <0.1% mill rejects)	250,000 tons	3 & 4 EHP/Beneficial Use
Waste Treatment Waste	125 million gallons	3 & 4 EHP
In-plant drains	Varies	1 & 2 STEP/ 3 & 4 EHP
Plant Area Drainage (Stormwater)	Varies	Road Dust Control
Boiler Waterside Cleaning Solution	Last done on Unit 4 in 2004; estimate 400,000 gallons	3 & 4 EHP
3 & 4 North Plant Area Drain Pond	Solids collected in pond removed ~ every 10 years, last cleaned in 2007; 1000 yd ³	Rosebud County Landfill
Waste Oil	20,000 gallons	Recycled off-site

*Annual volume is based on an estimated average of the past 5 years of operation.

3.0 Daily Activities

3.1 Sunday, August 30th – Travel Day/Project Kickoff Meeting

Sunday August 30, 2009 consisted of a travel day and a project kickoff meeting between the EPA/SAIC inspection team and Montana Department of Environmental Quality (MTDEQ) representatives. The inspection team consisted of Craig Haas (Project Manager, EPA Headquarters), Felix Flechas, (Team Lead, EPA Region 8 – Denver), David Rise (EPA Region 8 – Montana), and Jerry Whittum (SAIC). Tom Ring and Dan Freeland from Montana DEQ accompanied the inspection team. On Sunday night, the inspection team met at the Super 8 motel at 7:30 PM to begin the project kickoff meeting. Primarily, Montana DEQ provided the inspection team with background information about the Colstrip facility. During the meeting, a tentative inspection and sampling agenda was developed. At the conclusion of the meeting, the team decided to meet Monday morning at 8:45 AM to caravan to the site.

3.2 Monday, August 31st – Opening Conference/Process Overview/Site Walkthrough

On Monday August 31, 2009, the entire inspection team arrived at the main entrance security at 9:00 AM. Since the facility had been notified in advance of the inspection, the security office had visitor badges pre-made for the inspection team members. Plant security then directed the inspection team to the main office building where the inspection convened in a conference room. Introductions were conducted and Gordon Criswell (Environmental Manager, Colstrip Steam Electric Station) was noted to be the main point of the contact during the inspection. Mr. Criswell first explained the safety protocol for the site and noted that a test evacuation procedure

occurs each Wednesday at 2:30 PM. Mr. Flechas provided opening comments for the inspection team and stated that EPA Region 8 would lead the inspection. He also explained that the RCRA portion of the inspection would be conducted by himself, Mr. Haas, and Iver Johnson (Environmental Science Specialist, MT DEQ). Next, Mr. Haas explained that the inspections of electrical power plants were precipitated by the Tennessee Valley Authority (TVA) spill last year. He noted that the inspection would include environmental areas of RCRA, CWA, and EPCRA. Following the opening remarks by Mr. Haas, the inspection team presented credentials to Mr. Criswell. The inspection team then viewed a PowerPoint presentation facilitated by Mr. Criswell. The presentation, which contained pertinent Colstrip Plant background information, was provided as an introduction to the facility. While viewing the presentation, Mr. Criswell proceeded to answer questions from the inspection team. Following the presentation, the inspection team addressed additional background clarification questions to Mr. Criswell and other Colstrip staff. Reconvening following a lunch break, the Colstrip staff conducted a walking tour of the adjacent buildings that included generating Units 1 and 2, Units 3 and 4, main maintenance area, and Water Treatment. It was noted that Unit 4 was out of service due to an ongoing mechanical repair. The inspection team was taken to the roof of Unit 4 by the Colstrip staff to provide an aerial view of the north, east, and south Colstrip plant areas. Following the Unit 4 visit, the Colstrip staff proceeded to drive the inspection team around to the site areas that could not be conveniently reached from the main office building. The first portion of the driving tour included Bottom Ash Ponds 1 and 2, the Storm Water Pond, Pond A, Flyash Ponds 1 and 2B, the decommissioned Brine Pond, the Scrubber Drain Collection Pond (for Scrubbers 3 and 4, but last used in the mid-90s), the facility scrap equipment yard, Units 3 and 4 Ponds, Fuel and Petroleum Storage, and the Effluent Holding Ponds (EHP) for Units 3 and 4. The inspection team stopped the driving tour to take a walk on the paste surface of the Effluent Holding Ponds for a closer look at the area. From the pond, the team viewed the Paste Plant and the southern area of the Effluent Holding Pond where a leak was remediated. The team also observed the forced evaporators. The Colstrip staff and inspection team continued in the vehicles through the Town of Colstrip to Ponds 1 and 2. In that area, the team left the vehicles to observe the Stage 1 Pond, the Stage 2 Pond, the A. Cell, the E. Cell, the Paste Plant (under construction), Clear Well, and the two areas that will become ponds in the future. The Colstrip staff and inspection team returned to the main office building at 5:15 PM. The inspection team addressed additional questions to the Colstrip staff, which were answered. At approximately 6:00 PM, the inspection team left the facility for the day. Brandon Peebles, SAIC, met the inspection team on Monday evening.

3.3 Tuesday, September 1st – Process Overview/Site Walkthrough/Document Review

On Tuesday morning, September 1st, the entire EPA/SAIC inspection team arrived at the facility at 8:00 AM. Mr. Peebles retrieved his facility badge from the security office. The entire inspection team met the Colstrip representatives in the conference room and began discussing the Bevill exemption. Following the Bevill exemption discussion, the inspection team reviewed documents and discussed possible sampling locations. At 10:45 AM, the inspection team conducted a RCRA/SPCC walkthrough site inspection of the facility, in addition to further determining adequate sampling locations. The first stop of the walkthrough was the Units 3 and 4 Water Acid Pump Building. After inspecting the area around the building, the inspection team walked to the Building and Grounds area and the four main oil/water separator sumps. Following the lunch break, the inspection team and Colstrip representatives visited the chemistry lab, the Instrument Control Shop, and the Analyzer Lab. After discussions at each area, the inspection team concluded the walkthrough and returned to the conference room. Due to his early departure from the inspection, Mr. Flechas provided a mini-closing conference to Mr. Criswell and other Colstrip representatives at 3:45 PM. Following the closing conference, the inspection team

continued to review regulatory documents and finalized a list of sampling locations. The inspection team departed the facility at 4:30 PM.

3.4 Wednesday, September 2nd - Sampling

On Wednesday morning, September 2nd, the inspection team arrived on site at 8:00 AM. While the inspection team waited on Colstrip representatives to gather their sample containers, Mr. Haas asked Mr. Criswell a few questions and conducted minor discussions about the facility process. The entire day was dedicated to collecting water and sediment samples at the Colstrip facility. The first sample was collected at 9:50 AM and the last sample for the day was collected at 4:36 PM. After the last sample was collected, all of the coolers were prepared for proper shipment. Further sampling details (locations, methods, times, etc.) can be found in Section 4.0. The inspection team departed the facility for the day at 5:15 PM.

While SAIC conducted the sampling, Mr. Rise who was absent from the inspection during the morning, conducted an inspection for NPDES/Water during most of the afternoon.

3.5 Thursday, September 3rd – Closing Conference

On Thursday morning, September 3rd, the inspection team arrived on site at 8:45 AM. The inspection team met the Colstrip representatives in the conference room. After a brief discussion about the inspection events that occurred during the week, the inspection team began the closing conference at 9:05 AM. At the conclusion of the closing conference, a short question and answer session began. Following the session, the inspection team departed the facility at 9:50 AM. Mr. Whittum and Mr. Peebles finished preparing the sample coolers for proper shipment for the rest of the morning and early afternoon.

4.0 Sampling Activities and Field Observations

4.1 Background on Bevill Wastes

EPA is investigating the waste disposal practices at coal-fired power plants as they relate to the Bevill exclusion. The Bevill exclusion exempts from hazardous waste regulation independently managed large-volume wastes generated at coal-fired electric utilities that use coal as the primary fuel feed in their operations. These large-volume wastes are:

- fly ash waste
- bottom ash waste
- slag waste and
- flue gas emission control waste.

Other wastes from the combustion of coal or other fossil fuels are also Bevill exempt from regulation under RCRA subtitle C. These include:

- coal combustion wastes generated at non-utilities
- coal combustion waste from fluidized bed combustion technology
- petroleum coke combustion wastes
- waste from the combustion of mixtures of coal and other fuels
- wastes from the combustion of oil and
- wastes from the combustion of natural gas.

Finally, large-volume coal combustion wastes generated at electric utilities and independent power producing facilities that are co-managed with other coal combustion wastes are exempted. Common low-volume wastes fall into two categories: uniquely-associated and not-uniquely associated wastes. Common uniquely associated wastes are:

- coal pile runoff
- coal mill rejects such as pyrite and off-specification coal
- wastes from the cleaning of the exterior surfaces of heat exchangers
- floor and yard drains including wash water and stormwater
- wastewater treatment sludges and
- boiler fireside (inside of boiler tubes) chemical cleaning wastes.

If these low-volume, uniquely associated wastes are not co-managed with large-volume fossil fuel combustion wastes, they may be subject to regulation as non-exempt hazardous wastes if they are listed or exhibit a hazardous characteristic.

Low-volume wastes that typically are non-uniquely associated wastes and are not exempted are:

- boiler blowdown
- cooling tower blowdown and sludge
- intake and makeup water treatment and regeneration wastes
- boiler waterside cleaning wastes
- lab wastes
- construction and demolition debris
- general maintenance wastes and
- spills and leaks of process materials that generate non-uniquely associated wastes.

In particular, EPA is interested in the disposal of non-uniquely associated wastes with Bevill excluded wastes and SAIC sampling focused on sources potentially meeting these parameters

4.2 *Sample Collection Overview*

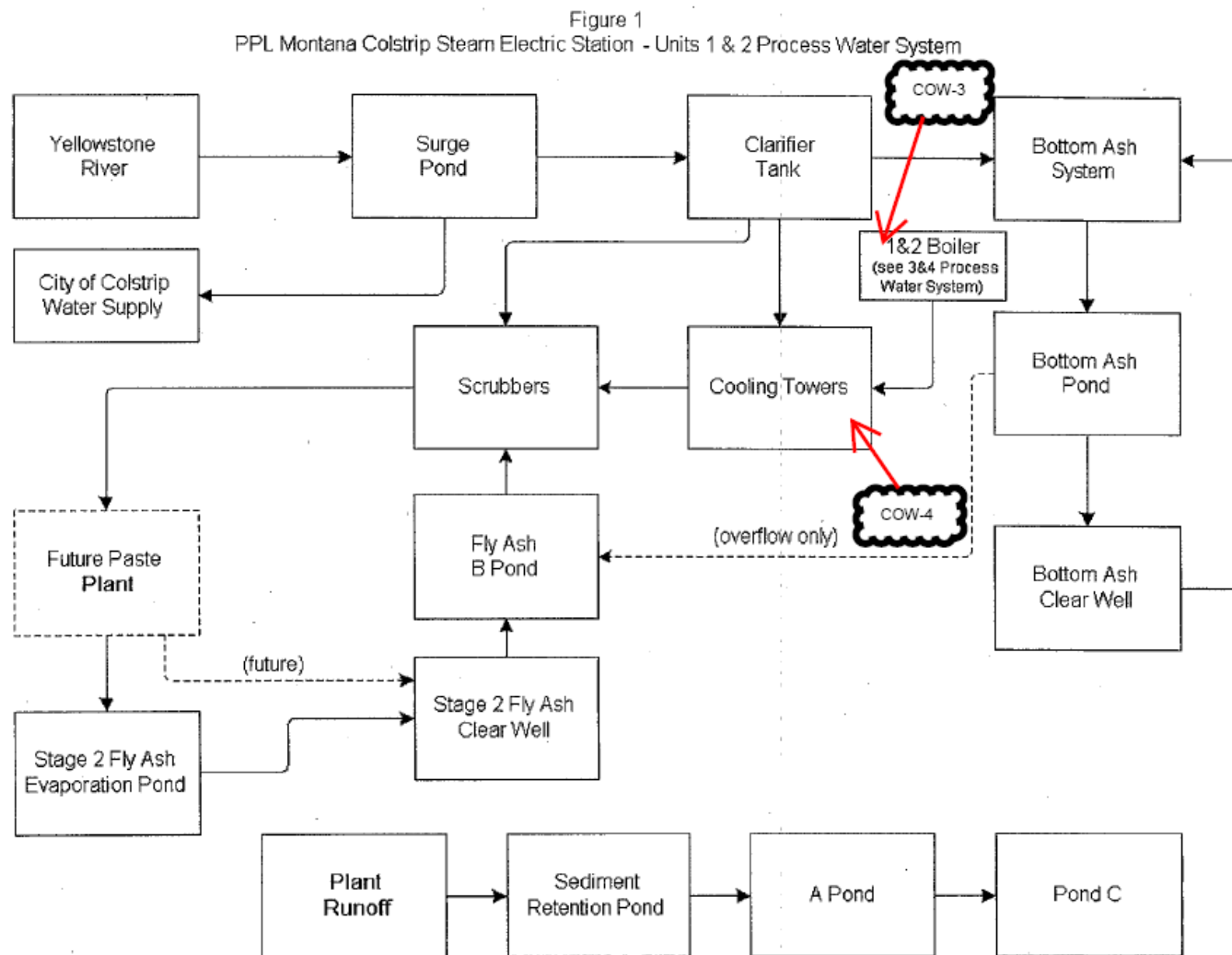
Samples were collected from the Colstrip facility on Wednesday, September 2nd (Section 4.3). Table 4-1 describes type and location of sludge/sediment samples as well as the number and type of sample containers filled for each sample. Table 4-2 describes type and location of wastewater samples, and the number and type of samples containers filled for each sample. Figure 4-1 and Figure 4-2 are copies of site water flow diagrams with sample locations identified.

Table 4-1. Sludge/Sediment Sampling Locations and Number and Type of Sample Containers Used

Sample ID	Sample Location	Volatiles	Ignitability/ Reactivity/ pH	SVOC/ PCB	TCLP	Metals
		4-oz Wide Mouth Glass (1)	4-oz Wide Mouth Glass (1)	4-oz Wide Mouth Glass (1)	16-oz Wide Mouth Glass (2)	4-oz Wide Mouth Glass (1)
COS-1	Historical Oil/Water Separator (Pass through) at Buildings and Grounds Maintenance	---	---	X	X	X

Table 4-2. Wastewater Sampling Locations and Number and Type of Containers Used

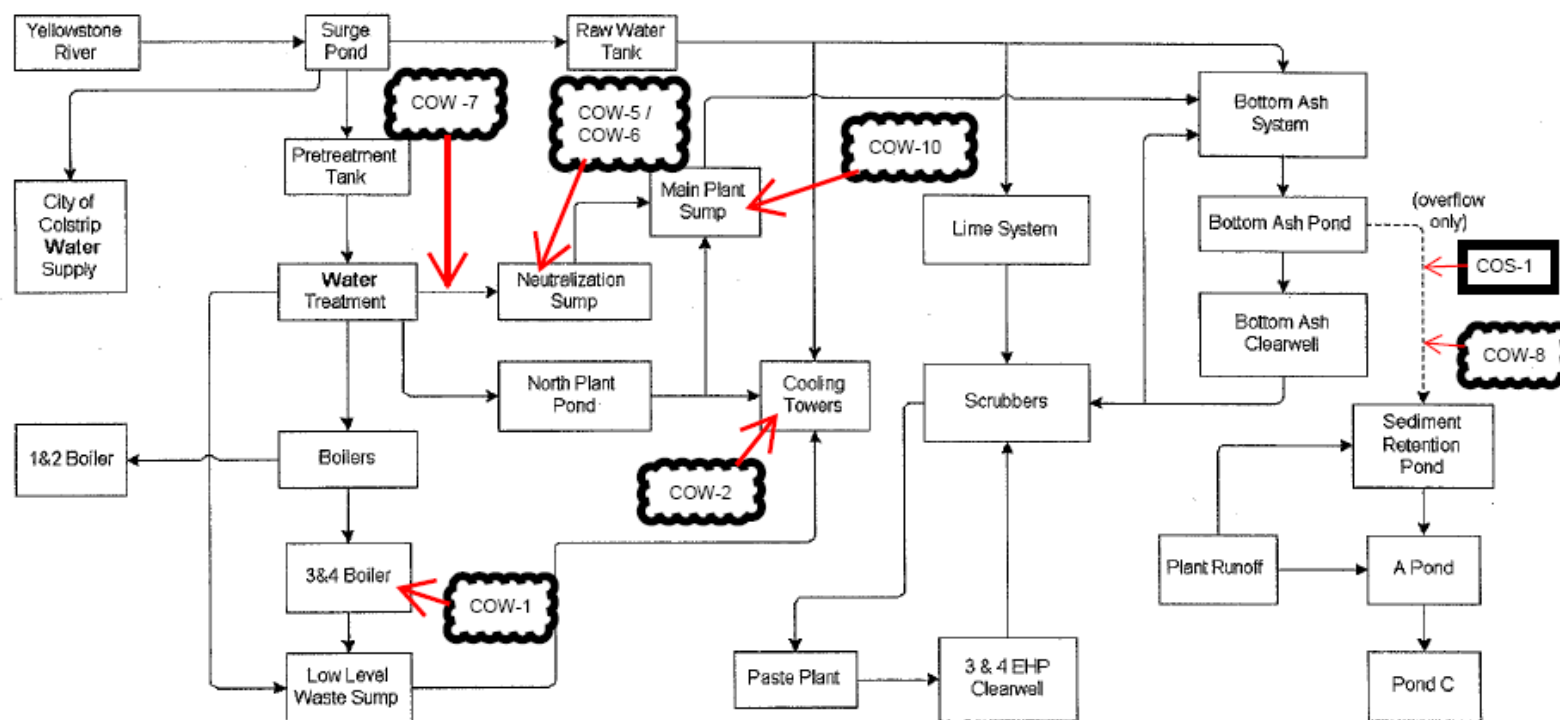
Sample ID	Sample Location	Volatiles	SVOC/ PCB	TCLP	Metals	TCLP
		40-ml VOA (2)	1-L Amber (1)	1-L Amber (3)	300-ml Plastic w/ HNO3 (1)	40-ml VOA (2)
COW-1	Unit 3 Boiler Blowdown Discharge Point (Analyzer Lab)	---	X	X	X	X
COW-2	Unit 3 Cooling Tower Blowdown Discharge Point (Analyzer Lab)	---	X	X	X	X
COW-3	Unit 1 Boiler Blowdown Discharge Point (Analyzer Lab)	---	X	X	X	X
COW-4	Unit 2 Cooling Tower Blowdown Discharge Point (Analyzer Lab)	---	X	X	X	X
COW-5	Neutralization Sump Discharge Point in the Unit 3 & 4 Building	X	X	X	X	X
COW-6	Neutralization Sump Discharge Point in the Unit 3 & 4 Building (Field Duplicate)	X	X	X	X	X
COW-7	Reverse Osmosis (RO) Reject in Unit 3 & 4 building	X	X	X	X	X
COW-8	Oil/Water Separator at Fuel Crew Building	X	X	X	X	X
COW-9	Neutralization Sump downstream of Cell 2 basin (Trip Blank)	X	---	---	---	---
COW-10	Neutralization Sump downstream of Cell 2 basin	X	X	X	X	X



2000161

Figure 4-1. Sample Locations on Units 1 and 2 Process Water Diagram

Figure 2
PPL Montana Colstrip Steam Electric Station - Units 3 & 4 Process Water System



2000162

Figure 4-2. Sample Locations on Units 3 and 4 Process Water Diagram

4.3 Wednesday, September 2nd Sampling Activities

This section provides specific information on each sample collected Wednesday, September 2, 2009.

4.3.1 Sample COW-1

Table 4-3 presents information for wastewater sample COW-1. SAIC personnel collected samples for EPA/SAIC according to the approved Quality Assurance Project Plan (QAPP). Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-3. Sample COW-1

Location	Unit 3 Boiler Blowdown Discharge Point (Analyzer Lab)
Date	September 2, 2009
Start Time	9:50 AM
Finish Time	10:08 AM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.89456, W 106.61294 (approximately 200 feet southeast of the location)
pH	8.4
Temperature	27.4° C
Sample Collection Method	Sample containers were placed under the discharge spigot for the Unit 3 Blower Blowdown to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-1 is a photograph of the COW-1 sampling location.

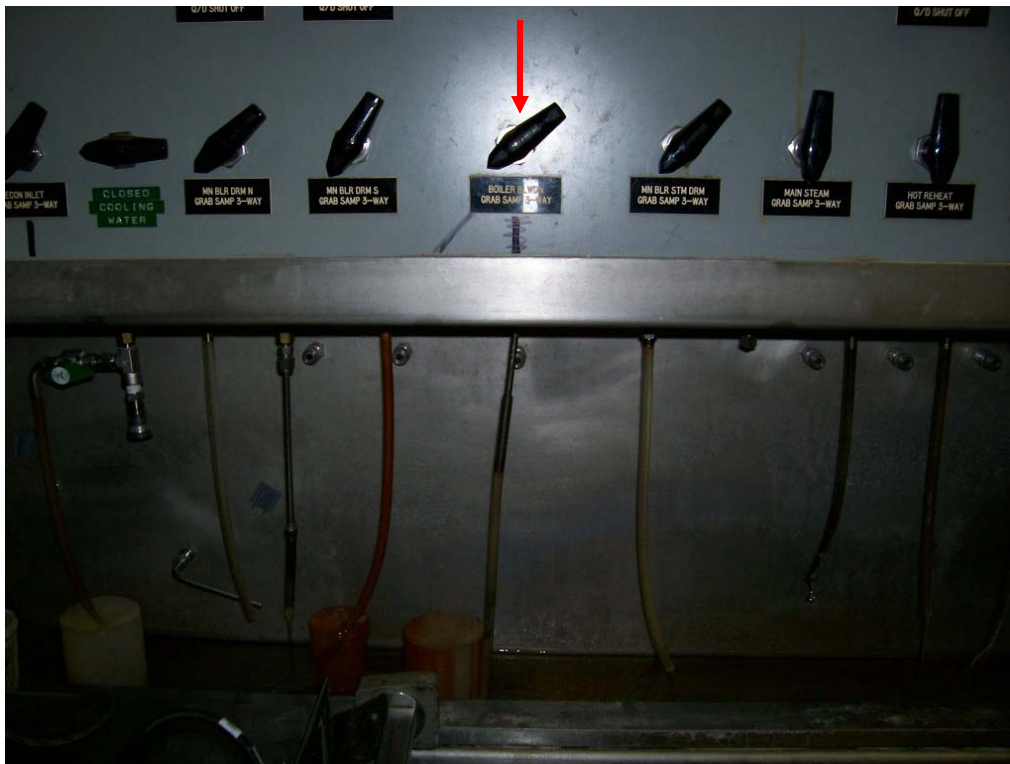


Figure 4-1. Sample COW-1: Unit 3 Blower Blowdown (spigot at bottom center of photo) in the Analyzer Lab

4.3.2 Sample COW-2

Table 4-4 presents information for wastewater sample COW-2. SAIC personnel collected samples for EPA/SAIC according to the approved QAPP. Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-4. Sample COW-2

Location	Unit 3 Cooling Tower Blowdown Discharge Point (Analyzer Lab)
Date	September 2, 2009
Start Time	10:13 AM
Finish Time	10:29 AM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.89456, W 106.61294 (approximately 200 feet southeast of the location)
pH	7.6
Temperature	25.2° C
Sample Collection Method	Sample containers were placed under the discharge spigot for the Unit 3 Cooling Tower Blowdown to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-2 is a photograph of the COW-2 sampling location.



Figure 4-2. Sample COW-2: Unit 3 Cooling Tower Blowdown (spigot at bottom center of photo) in the Analyzer Lab

4.3.3 Sample COW-3

Table 4-5 presents information for wastewater sample COW-3. SAIC personnel collected samples for EPA/SAIC according to the approved QAPP. Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-5. Sample COW-3

Location	Unit 1 Boiler Blowdown Discharge Point (Analyzer Lab)
Date	September 2, 2009
Start Time	10:41 AM
Finish Time	11:02 AM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.88451, W 106.61417 (location approximately 150 feet south in building)
pH	9.3
Temperature	24.5° C
Sample Collection Method	Sample containers were placed under the discharge spigot for the Unit 1 Boiler Blowdown to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-3 is a photograph of the COW-3 sampling location.



Figure 4-3. Sample COW-3: Unit 1 Boiler Blowdown in the Analyzer Lab

4.3.4 Sample COW-4

Table 4-6 presents information for wastewater sample COW-4. SAIC personnel collected samples for EPA/SAIC according to the approved QAPP. Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-6. Sample COW-4

Location	Unit 2 Cooling Tower Blowdown Discharge Point (Analyzer Lab)
Date	September 2, 2009
Start Time	11:03 AM
Finish Time	11:14 AM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.88451, W 106.61417 (location approximately 150 feet south in building)
pH	8.4
Temperature	27.6° C
Sample Collection Method	Sample containers were placed under the discharge spigot for the Unit 2 Cooling Tower Blowdown to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-4 is a photograph of the COW-4 sampling location.



Figure 4-4. Sample COW-4: Unit 2 Cooling Tower Blowdown in the Analyzer Lab

4.3.5 Sample COW-5

Table 4-7 presents information for wastewater sample COW-5. SAIC personnel collected samples for EPA/SAIC according to the approved QAPP. Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-7. Sample COW-5

Location	Neutralization Sump Discharge Point in the Unit 3 & 4 Building
Date	September 2, 2009
Start Time	11:49 AM
Finish Time	12:01 PM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.88432, W 106.61304
pH	8.4
Temperature	26.7° C
Sample Collection Method	Sample containers were placed under the discharge spigot for the Neutralization discharge point for Units 3 & 4 to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-5 is a photograph of the COW-5 sampling location.



Figure 4-5. Sample COW-5: Neutralization Sump Discharge Point in the Unit 3 & 4 Building

4.3.6 Sample COW-6

Table 4-8 presents information for wastewater sample COW-6. SAIC personnel collected samples for EPA/SAIC according to the approved QAPP. Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-8. Sample COW-6

Location	Neutralization Sump Discharge Point in the Unit 3 & 4 Building – Field Duplicate
Date	September 2, 2009
Start Time	12:02 PM
Finish Time	12:13 PM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.88432, W 106.61304
pH	8.4
Temperature	26.6° C
Sample Collection Method	Sample containers were placed under the discharge spigot for the Neutralization discharge point for Units 3 & 4 to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-6 is a photograph of the COW-6 sampling location.



Figure 4-6. Sample COW-6: Neutralization Sump Discharge Point in the Unit 3 & 4 Building (Field Duplicate)

4.3.7 Sample COW-7

Table 4-9 presents information for wastewater sample COW-7. SAIC personnel collected samples for EPA/SAIC according to the approved QAPP. Colstrip collected independent samples, alternating with the EPA/SAIC sampling.

Table 4-9. Sample COW-7

Location	Reverse Osmosis (RO) Reject in Unit 3 & 4 building
Date	September 2, 2009
Start Time	12:19 PM
Finish Time	12:33 PM
Sample Type	Grab
Matrix	Wastewater
GPS	N 38.63899, W 083.69978
pH	8.2
Temperature	22.7°C
Sample Collection Method	Sample containers were placed under the discharge spigot for the RO Reject water to obtain the sample. The wastewater was collected directly into the containers.

Figure 4-7 is a photograph of the COW-7 sampling location.



Figure 4-7. Sample COW-7: Reverse Osmosis (RO) Reject in Unit 3 & 4 building

4.3.8 Sample COS-1

Table 4-10 presents information for sediment sample COS-1. SAIC personnel alternately collected samples for EPA/SAIC and Colstrip in accordance with the approved QAPP.

Table 4-10. Sample COS-1

Location	Historical Oil/Water Separator (Pass through) at Buildings and Grounds Maintenance
Date	September 2, 2009
Start Time	2:14 PM
Finish Time	2:40 PM
Sample Type	Grab
Matrix	Sediment
GPS	N 45.88371, W 106.61522
Sample Collection Method	A 1-liter Teflon dipper with a long Teflon handle was placed into the Historical Oil/Water Separator. The dipper was used to scrape sediment out of the oil/water separator to obtain a sample. After a sufficient amount of sample was collected to approximately fill a 13-quart stainless steel bowl, the sample was mixed with a stainless steel spoon for one minute (until the consistency appeared homogenous). The sample was then scooped and packed into the sample containers using the stainless steel spoon and trowel.

Figure 4-8 is a photograph of the COS-1 sampling location.



Figure 4-8. Sample COS-1: Historical Oil/Water Separator (Pass through) at Buildings and Grounds Maintenance

4.3.9 Sample COW-8

Table 4-11 presents information for wastewater sample COW-8. SAIC personnel alternately collected samples for EPA/SAIC and Colstrip in accordance with the approved QAPP.

Table 4-11. Sample COW-8

Location	Oil/Water Separator at Fuel Crew Building
Date	September 2, 2009
Start Time	3:09 PM
Finish Time	3:24 PM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.88280, W 106.61520
pH	7.8
Temperature	20.0° C
Sample Collection Method	A 1-liter Teflon dipper with a long Teflon handle was used to obtain a sample of the wastewater in the oil/water separator. The wastewater was poured from the dipper directly into the sample containers using a stainless steel funnel.

Figure 4-9 is a photograph of the COW-8 sampling location.



Figure 4-9. Sample COW-8: Oil/Water Separator at Fuel Crew Building

4.3.10 Sample COW-10

Table 4-12 presents information for wastewater sample COW-10. SAIC personnel alternately collected samples for EPA/SAIC and Colstrip in accordance with the approved QAPP. SAIC also collected a trip blank according to the QAPP; these samples were analyzed for volatiles. The containers were labeled as samples COW-9 and were filled at the sampling location using deionized water obtained from Microbac Laboratories, Inc.

Table 4-12. Sample COW-10

Location	Neutralization Sump downstream of Cell 2 basin
Date	September 2, 2009
Start Time	4:16 PM
Finish Time	4:28 PM
Sample Type	Grab
Matrix	Wastewater
GPS	N 45.88284, W 106.61398
pH	11.1
Temperature	28.7° C
Sample Collection Method	A 2-gallon stainless steel bucket tied to a rope was lowered into the neutralization sump to obtain a sample. The bucket was then raised out of the sump, and wastewater from the bucket was poured via a stainless steel funnel directly into each sample container.

Figure 4-10 is a photograph of the COW-10 sampling location.



Figure 4-10. Sample COW-10: Neutralization Sump downstream of Cell 2 basin

4.4 Sample Packaging and Shipment

After initial sample collection, all of the sample containers were immediately placed into a cooler containing bagged ice until they could be packaged for shipment.

Sample packaging for shipment consisted of lining a cooler with a clean plastic trash bag and placing two 2-gallon Ziploc bags, approximately one-half full of ice on the bottom of the cooler inside the trash bag. A layer of large sample bottles were placed on top of the ice. Another layer of ice (in Ziploc bags) was added on top. The remaining sample containers were placed on top of the previous layer of ice. Finally, a third layer of ice (in Ziploc bags) was added on top, and the trash bag was sealed and secured by tying a knot and/or taping the bag shut. The chain of custody was properly completed for each sample location/cooler, inserted into a 2-gallon Ziploc bag which was sealed, and placed on top of the sealed trash bag inside the cooler. Copies of the chain of custody forms are located in Appendix C. The cooler was then taped shut with strapping tape. The custody seals were signed, dated, and placed on each cooler covered with a small piece of tape. Finally, the shipping air bill was properly completed and taped onto each cooler. This procedure completed the shipment process for each sample and its respective cooler.

During the entire sampling process (collection, packaging, etc.), SAIC followed the proper procedures outlined in the approved QAPP.

5.0 Analytical Results

Samples (nine aqueous and one solid) were collected at the Colstrip facility on September 2, 2009. Samples were analyzed for volatile organic compounds (VOCs) by method SW8260, semivolatile organic compounds (SVOCs) by method SW8270, metals by method SW6010 and mercury by SW7470 for aqueous samples and SW7471 for solids. Toxicity Characteristic Leaching Procedure (TCLP) extracts were prepared as per SW846 1311 followed by analysis by the above methods, as appropriate. TCLP VOCs were evaluated based on the results of the total analyses adjusted for the dilution of the extraction fluid and results were all below regulatory criteria; therefore a separate ZHE extraction was not required (as per SW846 1311, 1.2).

The complete tables of the analytical lab results are located in Appendix F. The raw lab data reports from the laboratory can be found in Appendix G in an electronic format. Sections 5.1 and 5.2 below present analytical results when parameters were identified over their method detection limit.

5.1 TCLP Analytical Results

Table 5-1 presents a summary for selected TCLP analyses for aqueous and sediment (solid) samples collected at the Colstrip facility for only those parameters detected over their method detection limits. None of the sample results exceeds the corresponding TCLP regulatory limit. The only metal above detection limits was arsenic with a TCLP limit of 5 mg/l. The only VOC above detection limits was chloroform with a TCLP limit of 6 mg/l. All other parameters not summarized in Table 5-1, which were analyzed, had results below their detection limits.

Table 5.1 Selected TCLP Analytical Results: Colstrip Aqueous and Sediment (Solid) Samples

Field Sample ID	TCLP	COW-1	COW-10	COW-2	COW-3	COW-4	COW-5	COW-6	COW-7	COW-8	COS-1
Matrix	Regulatory	Water	Water	Water	Water	Water	Water	Water	Water	Water	Solid
Sample Date	Criteria	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
TCLP Metals											
Arsenic	5	ND	ND	0.12	ND	0.12	ND	ND	ND	ND	ND
TCLP VOCs											
Chloroform	6	ND	ND	ND	ND	ND	ND	ND	0.0055	ND	ND

*ND - Not Detected

5.2 Total Analytical Results

Table 5-2 presents a summary of results for selected analytical results for aqueous and sediment (solid) samples collected at the Colstrip facility for only those parameters detected over their method detection limits. All other parameters not summarized in Table 5-2, which were analyzed, had results below their detection limits.

Tables 5-2. Summary of Selected Analytical Results: Colstrip Aqueous and Sediment (Solid) Samples

Field Sample ID	Aqueous Samples										Soil Sample
	COW-1	COW-10	COW-2	COW-3	COW-4	COW-5	COW-6	COW-7	COW-8	COS-1	
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Solid
Sample Date	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09	9/2/09
Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/kg
VOCs - Total											
Chloroform	NT	ND	NT	NT	NT	ND	ND	110	ND	NT	
SVOCs - Total											
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10,000
Metals - Total	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/kg
Aluminum	ND	3.0	0.52	0.029	0.76	ND	ND	ND	ND	ND	22000
Arsenic	ND	ND	0.12	ND	0.11	0.02	ND	ND	0.025	ND	
Barium	ND	0.41	0.38	ND	0.35	0.078	0.073	0.084	0.079	3000	
Cadmium	ND	0.0062	0.015	ND	0.011	0.01	0.0099	0.003	0.011	8.4	
Calcium	ND	440	590	ND	540	95	94	120	390	57000	
Chromium	ND	ND	ND	ND	ND	0.0032	0.0022	ND	ND	250	
Copper	0.011	ND	0.03	ND	0.48	ND	ND	ND	ND	450	
Iron	ND	0.33	0.63	ND	0.73	0.26	0.26	ND	ND	29000	
Lead	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	
Magnesium	ND	13	300	ND	280	55	54	59	420	24000	
Manganese	ND	0.032	0.38	ND	0.35	0.47	0.46	ND	3.4	680	
Nickel	ND	ND	0.015	ND	0.01	0.016	0.016	ND	ND	270	
Potassium	ND	19	57	ND	48	3.1	3.1	10	44	1100	
Selenium	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	
Sodium	1.2	320	840	1.1	550	910	920	150	550	2300	
Vanadium	0.00051	0.017	0.012	0.00068	0.014	ND	ND	ND	ND	26	
Zinc	ND	ND	ND	ND	0.043	ND	ND	ND	ND	740	
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9	
% Solids	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	26.87

*ND - Not Detected

*NT - Not Tested

5.3 Reliability of Analytical Results

Results were reviewed to determine the reliability of the data and evaluate any limitations on their use in support of project objectives. The data quality indicators were assessed including precision and accuracy. Sample quality control included holding times, surrogate recovery and internal standard results. Batch QC analyses included tuning and calibration, method blanks, laboratory control samples and matrix spikes. The results for each parameter are discussed below.

5.3.1 Sample Receipt

Samples were received at the lab without noted exception.

5.3.2 VOC Analytical Review

All samples for total VOCs were analyzed within method specified holding times. Prior to the analysis of any samples, the tune performance compound BFB was analyzed and an initial calibration (ICAL) was performed. Outlier compounds were evaluated for linearity via linear or non-linear regression. Every 12 hours that samples were analyzed, the instrument tune and calibration was verified. Continuing calibration verification (CCV) standards were analyzed as required and generally met criteria. The response factor for several compounds in the CCV exceeded the % difference (%D) criteria relative to the ICAL response factor. Often the response was greater in the CCV, most of the % percent differences were less than 40%, and the compounds were not detected. Therefore, there was no significant impact on data quality.

Surrogate and internal standards were added to the samples prior to analysis. Area counts and retention times for the internal standards met criteria and surrogate recoveries fell within laboratory control limits.

Method blanks were free of target compound contamination. Accuracy was assessed through the analysis of laboratory control samples (LCSs), which were analyzed with each analytical batch and matrix spikes or matrix spike duplicates (MS/MSD). A few compounds had recoveries that exceeded control limits; these compounds were not detected in the samples.

Sample COW-9 was the trip blank and was free from contamination. The analysis of the field duplicate pair, COW-5 and COW-6, resulted in all VOCs as non-detect for both samples.

5.3.3 SVOC Analytical Review

All extraction and analysis holding times were met for total SVOCs (aqueous and solid samples). The specified holding time for TCLP extracts is 7 days from the TCLP leachate extraction to the preparative extraction of the leachate for SVOCs. All TCLP leachate samples exceeded this holding time by four to five days; the data are qualified as estimated.

Prior to the analysis of any samples, the tune performance compound DFTPP was analyzed and an initial calibration (ICAL) was performed. Separate ICALs were analyzed for total soil SVOCs, aqueous total SVOCs, and TCLP SVOCs. Outlier calibration compounds were evaluated for linearity via linear or non-linear regression. Every 12 hours that samples were analyzed, the instrument tune and calibration was verified. The continuing calibration associated with the analysis of the soil sample had response factor (RF) % differences > 40% relative to the initial calibration for the following compounds: 3,3'-dichlorobenzidine, di-n-octyl phthalate, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene and benzo(g,h,i)perylene. These compounds were not detected in the soil samples and there is minimal impact on the detection limits reported, which were qualified as estimated. The continuing calibration associated with the aqueous total SVOC analyses resulted in a few outlier results for several compounds, but all % differences were <40%. The continuing calibration associated with the TCLP analyses met criteria for the target compounds. However, two samples were analyzed outside of the calibration clock: samples COW-8 and COW-10 were analyzed against a valid DFTPP tune. However a continuing calibration standard was last run 14 hours earlier. All TCLP SVOC data are considered estimated based on missed holding times and are therefore already qualified. All method blanks were free of target compound contamination.

Surrogates were added to samples prior to extraction and internal standards were added to the extracts prior to analysis. Internal standard area counts and retention time criteria were met for all samples with the exception of the following: COS-1 total SVOC analysis and COW-5, COW-6 and COW-8 TCLP SVOC analyses. The chromatograms for these samples show baseline interference that impacted the last two internal standard area counts. Data for these samples were qualified as estimated. Surrogate recoveries fell outside laboratory control limits for several analyses. The total SVOC analysis of sample COW-10 had one base-neutral and one acid-extractable surrogate recovery below control limits, and the data are qualified as estimated. Total SVOC analysis of COW-2 resulted in two acid extractable surrogate recoveries that were less than 10%; data for this analysis were therefore considered unusable and were flagged "R". Three TCLP leachates had surrogate results outside control limits; phenol-d5 recovery for COS-1, COW-1 and COW-7 was 11.5-12.5%; these data are considered estimated (and were previously qualified based on holding times).

Laboratory control samples (LCS) and matrix spike duplicates were analyzed with each batch of samples to assess accuracy and precision. TCLP spikes and LCS results were below control limits for pyridine and 1,4-dichlorobenzene. The LCS/D associated with the total SVOC of the aqueous samples had low recovery for hexachlorocyclopentadiene and pyridine, resulting in these compounds being considered estimated; carbazole showed no recovery in the LCS and data for this compound were flagged "R". The soil LCS/D also indicated a lack of recovery for Carbazole and the compound in the soil samples was also flagged "R".

The analysis of the field duplicate pair, COW-5 and COW-6, resulted in all SVOCs as non-detect for both samples.

5.3.4 Metals Analytical Review

Samples were analyzed for Total TAL metals and TCLP metals. All samples were analyzed within method specified holding times.

Calibration was performed as per method requirements and included initial calibration verification standards, continuing calibration verification standards, initial and continuing calibration blanks. Continuing calibration check standards (CCCs) exceeded criteria for one or more standards for mercury; positive results are considered estimated values. Calibration blanks met method criteria, with the exception of selenium resulting in the qualification as estimated of the positive results for sample COW-4. A method blank associated with the TCLP analyses contained low level concentration above the reporting limit of arsenic; positive sample results for COW-2 and COW-4 (which were less than 10 times the blank level and were therefore potentially impacted by the blank contamination) were qualified as estimated. The method blank associated with the total metals analysis of the aqueous samples also contained arsenic at a concentration which impacts the results of samples COW-5 and COW-8. Arsenic results for these samples were less than 10 times the blank level and are therefore considered estimated.

The LCS associated with the TCLP analyses had low recovery of silver; the non-detect results are considered to be estimated detection limit values. Matrix spike duplicates (MS/MSDs) were analyzed with each batch of samples. For the soil spikes, both the MS and MSD recoveries were below control limits for antimony; the non-detect soil results are considered to be estimated detection limit values.

Field duplicate results for total metals in COW-5 and COW-6 were in agreement, with the RPD less than 5% between the samples for most metals that were detected at concentrations above the

reporting detection limit. The one exception was chromium detected at concentrations just above the reporting limit (RL) and having an RPD of 37% for a sample concentration of 0.0032 mg/l, a field duplicate result of 0.0022 mg/l and a reporting limit of 0.002 mg/l.

5.4 *Summary of Data Usability and Limitations*

Based on the review of analytical data, as detailed above, some sample results have been identified as having QC non-conformance such that the data cannot be used without qualification. Several results were considered unusable; the results for these samples were qualified with a Data Validation Qualifier (DVQ) of R. Other data that were considered to be estimated results were qualified with a DVQ of J and have been so indicated in the attached Colstrip Data Review Tables.

All other sample data can be used without additional limitation or qualification for the evaluation of project objectives.

6.0 Regulatory Review

6.1 RCRA

Mr. Felix Flechas, EPA Region 8 was the technical lead on the RCRA inspection. The SAIC team provided technical support. The results of the regulatory review will be documented by Mr. Flechas.

6.2 EPCRA

6.2.1 Tier I and II

Subpart B Community Right-To-Know reporting requirements apply to any facility that is required to prepare or have available a material safety data sheet (MSDS) for a hazardous chemical under the Occupational Safety and Health Act of 1970 and regulations promulgated under that Act. The minimum threshold for reporting for extremely hazardous substances is 500 pounds (or 227 kilograms--approximately 55 gallons) or the threshold planning quantity (TPQ), whichever is lower. The minimum threshold for reporting for all other hazardous chemicals is 10,000 pounds (or 4,540 kilograms) (40 CFR §370.20).

40 CFR §370.25 requires the owner or operator of a facility subject to Subpart B to submit an inventory form to the State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC), and the fire department with jurisdiction over the facility. The inventory form containing Tier I information on hazardous chemicals present at the facility during the preceding calendar year above the threshold levels stated above must be submitted on or before March 1st of each year. The facility may submit a Tier II form in lieu of the Tier I information.

SAIC performed the following reviews for the calendar years 2006, 2007 and 2008 Tier I forms for the Colstrip Plant.

1) SAIC confirmed that the reports had been submitted by March 1st each year for the previous calendar year to the SERC, LEPC and local emergency response agency.

Colstrip staff provided copies of signed transmittal letters and attached Tier I Forms for calendar years 2006, 2007, and 2008. These documents confirm that Tier I reports were submitted before March 1st of each calendar year.

2) SAIC spot checked quantities of chemical stored in various locations throughout the facility to identify any chemicals currently stored in excess of the respective reportable quantity, recognizing that current quantities are not reportable until next March. The intent was to identify chemicals currently in excess of TPQs and attempt to determine if TPQs were exceeded in 2006, 2007, and 2008 by reviewing inventory records, when available.

Current storage capacities were spot checked versus the inventory provided with 2008 Tier I Forms to confirm all chemicals currently above TPQ were reported for last calendar year or an explanation was provided why such chemicals were not reported (e.g., the chemical was first ordered and procured in 2009). The SAIC inspector did not observe any chemicals currently exceeding TPQ values that had not been reported in previous Tier I reports.

3) To the extent time constraints and the availability of Colstrip personnel and documentation permitted, storage capacity of tanks was confirmed and these were compared to Tier I reported quantities. Three omissions were noted during the review of the Tier I report:

- a) Colstrip staff confirm that it utilizes lead-acid batteries for stationary backup power but does not report those batteries in the Tier I reports. Based on the information in Appendix B it is estimated that the sulfuric acid in these batteries exceeds the 500-pound TPQ.
- b) Colstrip uses dedicated on-site mobile equipment (forklifts and material handling equipment such as dozers and backhoes) but does not report batteries installed in those pieces of equipment. (An inventory of equipment and associated battery type is provided in Appendix C). The total capacity of sulfuric acid in these batteries is estimated as exceeding the TPQ of 500 pounds.
- c) Colstrip reports gasoline and liquefied petroleum gas (LPG) usage on TRI reports but does not report storage of these hazardous chemicals on the Tier I Forms. Based on TRI annual usage, it is estimated that the storage capacity exceeds the reporting threshold of 10,000 pounds.

The total storage capacity of these three hazardous materials (sulfuric acid, gasoline, LPG) needs to be confirmed.

6.2.2 Toxics Release Inventory (TRI)

The Environmental Manager at the Colstrip Plant confirms that the facility is covered as defined in 40 CFR §372.22 and is required to implement Toxic Chemical Release Reporting, commonly known as TRI, because it has more than 10 employees and is in a covered Standard Industrial Classification (SIC) code.

40 CFR §372.25(b) requires TRI reporting by facilities that manufacture or process 25,000 pounds of a chemical for the year and “otherwise use” at a facility 10,000 pounds of the chemical for the applicable calendar year. Manufacture means to produce, prepare, import, or compound a toxic chemical. Manufacture also applies to a toxic chemical that is produced coincidentally during the manufacture, processing, use, or disposal of another chemical or mixture of chemicals,

including a toxic chemical that is separated from that other chemical or mixture of chemicals as a byproduct, and a toxic chemical that remains in that other chemical or mixture of chemicals as an impurity. Otherwise use means any use of a toxic chemical, including a toxic chemical contained in a mixture or other trade name product or waste, that is not covered by the terms "manufacture" or "process." Otherwise use of a toxic chemical does not include disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction. Process means the preparation of a toxic chemical, after its manufacture, for distribution in commerce.

SAIC reviewed the 2006, 2007, and 2008 TRI-calculation spreadsheets provided by Colstrip staff and spot checked the accuracy of calculations. The spot check indicates that, for chemicals included in the report, TRI data are properly calculated and reported.

6.3 CWA

6.3.1 Storm Water Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) Review

Montana is an authorized state under the federal permitting program. The MT DEQ administers the National Pollutant Discharge Elimination System (NPDES) permit program, which is authorized under the Montana Code Annotated and the Administrative Rules of Montana. The Montana NPDES Permit Regulation sets forth the policies and procedures that are followed in the administration of the permit program as mandated by the Clean Water Act and EPA's Phase 1 (11/16/90) and Phase 2 (12/8/99) stormwater regulations. MT DEQ issues NPDES permits that regulate stormwater discharges from "industrial activities" as well as the discharge of industrial and sanitary waste. However, MT DEQ did not issue an NPDES permit for discharge of industrial and/or sanitary waste or the discharge of stormwater from the facility.

The Colstrip Plant utilizes water for generation of steam to power turbines to produce electricity. In addition to using water for steam, Colstrip also utilizes water as a coolant for plant processes and to trap the byproducts of coal combustion. Figures 6-1 through Figure 6-4 present schematics of water flow at Colstrip. The Colstrip Plant gets its water from the Yellowstone River, about 30 miles north of the facility. The Nichols pump house routes the river water to Castle Rock Lake (surge pond). The water is stored at Castle Rock Lake for use at the plants and for the City of Colstrip's water supply. The flue gas scrubber and the four cooling towers use most of the water at the Colstrip facility. For all of the units, the process water is recycled and retained on site as it flows through scrubbers, boilers, bottom ash ponds, fly ash ponds, the lime system, and plant sumps. Some of the water collected in the ponds is evaporated. Stormwater runoff is collected in concrete-lined ditches and pumped to the Sediment Retention Pond. It is then pumped to Pond A and Pond C South where it is used for road dust control. There are no NPDES discharge points at the Colstrip Plant.

Because all process waters are contained or used on site (including stormwater runoff) and none of the water is returned to natural watercourses, the Colstrip staff and MT DEQ certify the facility as a "zero discharge" facility. Thus, the Colstrip Plant has no NPDES permits for wastewater or stormwater.

1) SAIC verified that Colstrip was not issued an NPDES permit. Mr. Tom Ring, MT DEQ, stated that Colstrip Units 3 and 4 were permitted under the Montana Facility Siting Act which provides a certificate to construct and operate a facility. The certificate identifies that all waste must be stored in sealed ponds, a groundwater monitoring program must be conducted, and if

groundwater contamination is observed, the facility must recover the contamination and return it to the facility ponds. He stated that Units 1 and 2 are operated under the original certificate issued in the early 1970s.

2) SAIC confirmed that no NPDES or stormwater discharge points were observed. Mr. Rise, EPA Region 8, conducted an inspection of Armells Creek adjacent to the power generation plant area and did not observe discharge piping or leakage from the facility ponds. He also inspected the area of Ponds 1 and 2, where past leakage had occurred into the area of a future pond cell. Additionally, he inspected the area of Ponds 3 and 4 and along Cow Creek, but did not observe a discharge pipe or leakage.

Figure 1
PPL Montana Colstrip Steam Electric Station - Units 1 & 2 Process Water System

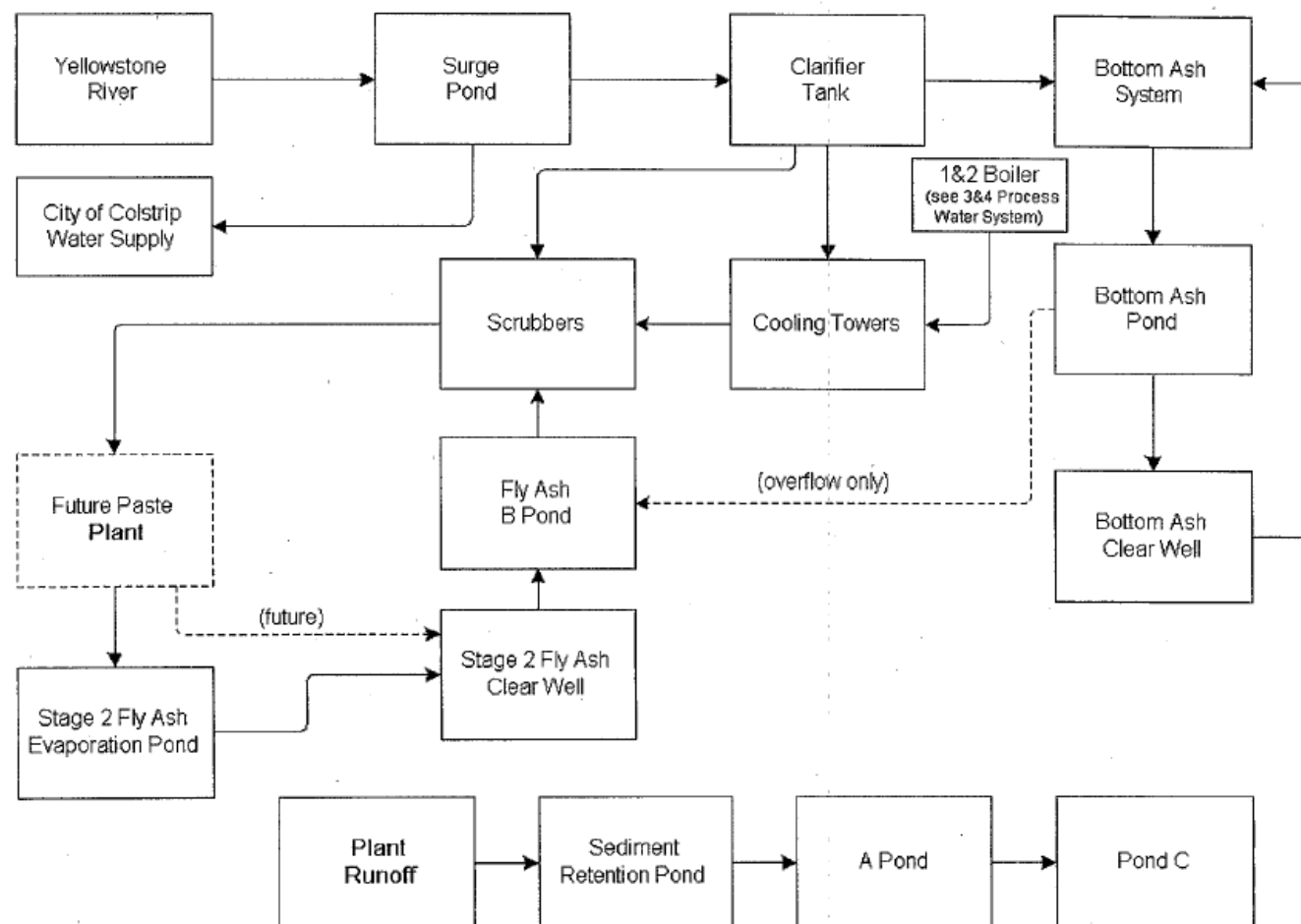


Figure 6-1. Schematic Process Water Flow Diagram for Units 1 and 2

Figure 2
PPL Montana Colstrip Steam Electric Station - Units 3 & 4 Process Water System

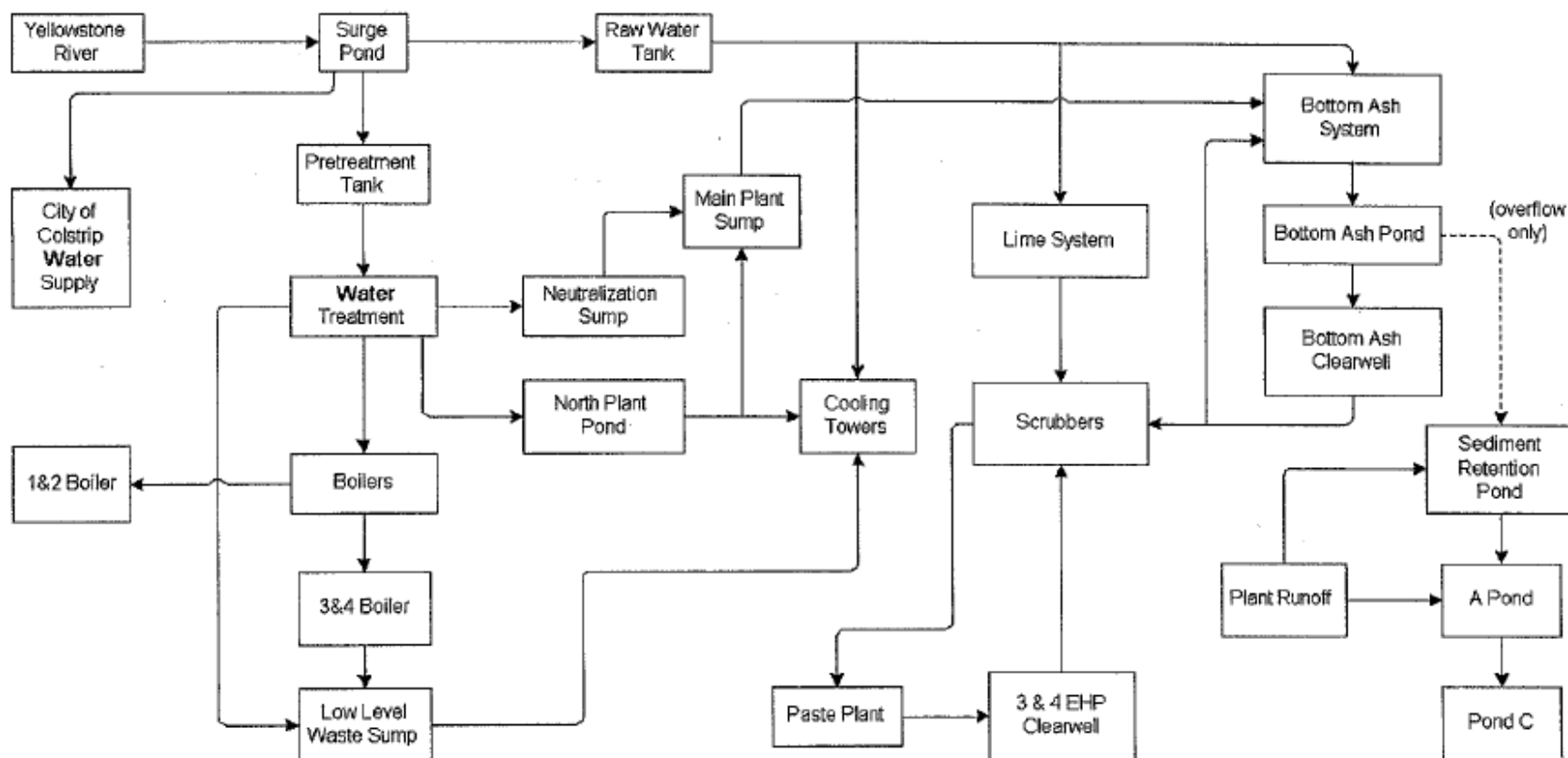


Figure 6-2. Schematic Process Water Flow Diagram for Units 3 and 4

6.3.2 Spill Prevention, Control, and Countermeasure (SPCC) Plan and Facility Response Plan (FRP) Review

40 CFR §112, the Oil Pollution Prevention regulation, which is promulgated under the authority of §311 of the Clean Water Act (CWA), sets forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines and to contain discharges of oil, this regulation requires these facilities to develop and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan and establish procedures, methods, and equipment requirements. Any facility storing over 1,320 gallons of petroleum, oil, or lubricant (POL) in containers of 55 gallons or greater must prepare and implement an SPCC Plan (Plan). Colstrip stores over 1,320 gallons of POL and is subject to 40 CFR §112 requirements.

Additionally, Subpart D of 40 CFR §112 requires that an owner or operator of a non-transportation-related onshore facilities that, because of location, could reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shoreline, develop a facility response plan (FRP). Facilities required to prepare and implement an FRP include facilities that maintain total oil storage capacity greater than or equal to 1 million gallons and is located at a distance such that a discharge from the facility could cause injury to fish and wildlife and sensitive environment. Colstrip maintains a total oil storage capacity greater than 1 million gallons of POL, but has neither prepared and implemented an FRP nor provided certification that the facility is not a substantial harm facility.

SAIC performed the following reviews for the Colstrip Plant.

- 1) SAIC confirmed that an SPCC Plan was not prepared for the facility. Colstrip staff stated an SPCC Plan is not required because the site topography would cause all POL spillage to be contained on site. Colstrip conducted a study and prepared a document of the potential for POL spillage to be discharged to Armells Creek titled *Discussion of the Need for an SPCC Plan at Colstrip Project Division*, dated May 14, 1997 (Appendix D).
- 2) SAIC conducted a preliminary review of the *Discussion of the Need for an SPCC Plan at Colstrip Project Division* document. No obvious discrepancies were identified.
- 3) SAIC conducted visual inspections of the bulk POL aboveground storage tank areas (i.e., two 500,000-gallon diesel fuel tanks, one 17,000-gallon and one 5,770-gallon turbine lubrication oil tanks). Armells Creek, the only receiving water in the vicinity of the bulk storage tanks, is located at Colstrip's west property boundary approximately one-half mile from the tanks. SAIC could not verify the direction of flow from the two 500,000-gallon diesel tanks, but did determine that a flow west toward Armells Creek would enter the North Plant Stormwater/Sediment Pond and then be pumped to the North-Lined Pond. SAIC observed that the turbine oil tanks are located in a generally flat paved area approximately 0.4 miles east of Armells Creek.

7.0 References

SAIC. 2009. *Quality Assurance Project Plan for Power Plant Waste Management Compliance Investigations*. Science Applications International Corporation. June 2009.

APPENDIX A

GOOGLE EARTH PHOTOGRAPHS



Overview of the Colstrip Steam Electric Station



Colstrip Steam Electric Station Central Area

APPENDIX B

ADDITIONAL DOCUMENTATION

**“Colstrip In-Plant System Batteries”
Document**

PPL MT Colstrip In-plant System Batteries					
Unit	Voltage	Manufacturer	# of Cells*	Volts per Cell	Banks per Unit
3	250	Gould-Brown Boveri	120	2.17 Normal 2.33 Max	1
4	250	Gould-Brown Boveri	120	2.17 Normal 2.33 Max	1
		Total Cells	240		
3	125	Gould-Brown Boveri	60	2.17 Normal 2.33 Max	3
4	125	Gould-Brown Boveri	60	2.17 Normal 2.33 Max	3
		Total Cells	360		
1	125	AT&T	60	1.75 Normal	1
2	125	AT&T	60	1.75 Normal	1
		Total Cells	120		
1&2 Deisel Gen Eng	24				1
Fire Protection	12	Gel Cells	30*		

*The battery cells are filled with sulfuric acid.

** 30 batteries (not cells) in Fire Protection System

APPENDIX C

ADDITIONAL DOCUMENTATION

**“Colstrip Mobile Equipment Batteries”
Document**

PPL MT Colstrip Mobil Equipment Batteries

Type of Equipment	Manufacturer	Model Number	Serial Number	Year	Annual Inspection completed On	Number	Voltage	Area
Cushman Titan	Cushman	898336A	95006470	1995		6	6	O&M Day Shifters
Cushman Electric Truck	Cushman	898336B	960006978			6	6	Scrubbers
Cushman Electric Truck	Cushman	898336A	94003044	1994		6	6	Scrubbers
			Total Number of 6 Volt Batteries			18		
Broaderson Picker	Broaderson	1C-80-1G	527859	2004	2/12/2009	1	12	Maintenance
Picker	Broaderson	1C-20-1D	338 B	1994	1/7/2009	1	12	Scrubbers
Picker	Broaderson	1C-20-1C	239 B	1989	2/13/2009	1	12	Maintenance
Picker or Hoist	Broaderson	1C-20-1C	228 B	1989	2/13/2009	1	12	Maintenance
Picker or Hoist	Broaderson	1C-20-1G	55002	2008	Late 2008	1	12	Maintenance
Picker or Hoist	Broaderson	1C-20-1D	303 B	1992	2/11/2009	1	12	Maintenance
International Model 4900 6X4	International	International 4900	1HTSHPBR3MH393718	1991		4	12	Buildings and Grounds
International NAVI Dump Truck	International	International SF62500 7400 SBA 6X4	1HTWGAR87J453142	2007		4	12	Buildings and Grounds
LPG 6000 lb Forklift	Hyster	H60XM	D177B02884P	1993		1	12	Mobil Equipment Maint
LPG 5000 lb Forklift	Hyster	0 ME FL 4218	D177B02192P	1993		1	12	Machine Shop
	Eagle Pitcher 4 Wheel Drive	RT60	4RT01325	2003		1	12	Warehouse
Rough Terrain Forklift	Caterpillar	VC600D	2MC02568	1992		1	12	Turbine Deck 3&4
LPG 6000 lb Forklift	Caterpillar	V60B	89W00558	1981		1	12	Scrubbers
LPG 8000 lb Forklift	Caterpillar	GP40	1CM01491	1997		1	12	Buildings and Grounds
LPG 8000 lb Forklift	Caterpillar	GP40	1CM00318	1995		1	12	Mills
LPG 11000 lb Forklift	Yale	GLP110GNBE098	B813D03999	1998		1	12	Mills
LPG 6000 lb Forklift	Yale	GDP060TG	A875B32678C	2005		1	12	Buildings and Grounds
LPG 5000 lb Forklift	Yale	GLP0500ZGEGAE084	A875B311138	2005		1	12	Warehouse
LPG 6000 lb Forklift	Yale	GLP060VXEGSED87	B87505674D	2006		1	12	Warehouse
Grader Caterpillar	Caterpillar	130G	74V01554	1979		2	12	Buildings and Grounds
Kodiak Diesel Fuel Truck	chevrolet	Truck and Tank	1GBM7H1J107698	1992		4	12	Fuel Crew & Mobile Equip. Storage
Vac Truck	International	SF26740	1HTGLATT4YH671110	1999		4	12	Fuel Crew
Ford F-550 XL V8 Turbo Diesel	Ford	Ford F-550 XL	1FDAW57P53EC58018	2003		1	12	Rescue Team Barn
High Pressure Washer Truck	Kenworth		160770K	1978		2	12	Maintenance
Ford Truck 2-Ton	Ford	LN600	CSG6496004F	1981		1	12	Mobil Equipment Storage.
4600 Gallon Water Truck	Peterbilt	3924	2NPLLD0X97M677428	2007		4	12	Outside/Fuel Crew Shifters
34 FT. JLG (small)	Great Northern Equip.	34HA	30014990	1991		1	12	Electricians
Wacker Pump	Wacker Corp	PT6LT	5582871	2005		1	12	
6" Pump Detroit Diesel Engine	Gorman Rupp	16A25034	1217811	1982		1	12	Mobil Equipment Storage.
Gorman Rupp 6" Portable Pump	Gorman Rupp	16C2-F300	7951131	1983		1	12	Mobil Equipment Storage.
Gorman Rupp 6" Portable Pump	Gorman Rupp	16C2-F5L912	8559363	1999		1	12	Mobil Equipment Storage.
4000 LPG rough Terrain Forklift	Caterpillar	R80	39A00873	1992		1	12	Water Treatment
	Eagle Pitcher 4-W Drive	RT60	4RT01325	2003		1	12	Warehouse
tennant Power Sweeper Rider	Tennant	830II	830II-4639	2002		1	12	Buildings and Grounds
tennant Sweeper	Tennant	6400	6400-3242	2002		1	12	Warehouse
Floor Sweeper	Tennant	6080	6080-3863	1993		1	12	Auto Shop
Ford Tractor FC215M	Ford	7700	606805	1978		1	12	Buildings and Grounds
High Pressure Washer/Trailer Mounted	Jetstream	4215D	6127	2006		1	12	Paste Plant/ scrubbers
Air Pak Welder	Lincoln	K3225-1	U1061202896	2007		1	12	Fuel Crew
High Pressure Washer	Altex	HL IW 1200T	77-11036	1990		1	12	
Arc Welder	Lincoln	SAE-300 4236	A923701	1982		1	12	Maintenance
Arc Welder	Lincoln	SAE-300	A-923702	1982		1	12	Mobil Equipment Storage.
Mobil Arc Welder	Lincoln	WT2530	923703	1985		1	12	Maintenance
Welder	Miller	Airpak	KC257936	1992		1	12	Mobil equipment storage
Air Compressor	Sullair	375HPQJD	004-140466	2003		1	12	Maintenance
Air Compressor	Sullair	SA 375DPQ	2.00706E+11	2007		1	12	Maintenance
Grover Picker 25 Ton	Grove	RT625	45451	1980	2/11/2009	1	12	Maintenance
Grover Picker 18 Ton	Grove	RT400	78137	1993	2/10/2009	1	12	Maintenance
60-Ton R T Crane Grove	Grove	RT60E	222923	2002	2/9/2009	1	12	Maintenance
Cat D3 Dozer	Caterpillar	D3B	27Y0837	1981		1	12	Buildings and Grounds
Hitachi Back Hoe	Hitachi	EX150	133-2830	1993		1	12	Buildings and Grounds
Generator	Caterpillar	CAT XQ225	8JJ00566	1999		1	12	Buildings and Grounds
Cat Generator 350 KW	Caterpillar	XQ350	4JK00366			1	12	
Generator (40KW standby)	Terex	OT50J	FYG-12133	2004		1	12	
Generator	Multiquip	DCA70SSJU	7302775	2001		1	12	
Generator	Multiquip	DCA-70SSJU	7301633			1	12	Maintenance
Cat Generator 36 KW	Terex	OT50J	EUG-09803	2004		1	12	
Generator	Terex	OT50J	EUG-09020	2004		1	12	
Generator (40KW standby)	Terex	OT50J	FYG-11904	2004		1	12	
Generator (40KW standby)	Terex	OT50J	FYG-11907	2004		1	12	
Skid Steer Loader	Bobcat	463	522212608			1	12	Scrubbers
Loader	Bobcat	463	522212612	2003		1	12	Scrubbers
Loader	Caterpillar	992C	49200221	1983		4	12	Fuel Crew
Skid Steer Loader	Bobcat	463	538913000	2006		1	12	Scrubbers
Front Wnd Loader	Volvo	L120C	L120CV61310	1995		2	12	Buildings and Grounds
990 II Loader	Caterpillar	990 II	CAT00990JBCR00164	2002		4	12	Fuel Crew
Loader	Caterpillar	236	CAT00236K4YZ05454	2002		1	12	Buildings and Grounds
Light Tower	Allmand	Night-Pro Maxilite	040PR004	2003		1	12	Maintenance
Gorman Rupp 4" Portable Pump 60 HP	Ford	14C2-F200	801224	1983		1	12	Mobil Equipment Storage
Centrifugal 4" pump	Gorman Rupp	F300	816445	1984		1	12	5 & 6 Ponds
Manlift	JLG	JLG80HX	300061222	2001		1	12	Maintenance
JLG Single Person Man Lift	JLG	1210	603311	1997		1	12	Electricians
	Presto Lee Engine Co.	B566-1500	64208			1	12	1 & 2 Maintenance
Manlift	JLG	34HA	4.2171E+16	1997		1	12	Buildings and Grounds
Scissors Lift	Genie	GS-1930	40772	2001	2/12/2009	6	12	Electricians and Turbine Deck
Manlift	Genie	GR-20	GR07-9117	2007	2/11/2009	1	12	electricians
Toolcat 5600T/ Mower	Bobcat	5600T/72 mower	424711646/230400593	2005		1	12	Buildings and Grounds
Roller	Raygo	Rascal	SPMB200201241506	1987		1	12	Buildings and Grounds
Tractor Truck Semi	Freightliner	C120064T	1FUPYCYB2GP272445	1986		4	12	Buildings and Grounds
LT8000 5" Wheel Truck	Ford	LT8000	U81UV6D9451	1980		4	12	Maintenance
			Total Number of 12 Volt Batteries			115		
Battery Power Order picker	Crown	30SP36TT	1A10111633	1991	2/12/2009	1	36	Warehouse
Battery Power Order picker	Crown	30SP36TL	W29021		2/12/2009	1	36	Warehouse
Battery Power Tow Truck	Crown	200TWR	W27218	1982		1	36	Warehouse
Battery Power Tow Truck	Yale	MTR700LCN24T	A817N068622	2002		1	36	Warehouse
			Total Number of 36 Volt Batteries			4		


APPENDIX D

ADDITIONAL DOCUMENTATION

**“Discussion of the Need for a SPCC Plan”
Document**

Memorandum

To: Mike Enterline/Leadership Staff

From: Jim Parker 

Date: May 14, 1997

CC:	<u>With Attachments</u>	<u>Without Attachments</u>
	Mary Gail Sullivan	Tom Olson
	Bill Hageman /Ginny	Gordon Criswell
	Koczur/File HMW-33	Chemistry & Environmental Department

RE: Discussion of the Need For an SPCC Plan

Attached please find the report "Discussion of the Need for an SPCC Plan at Colstrip Project Division", dated 5/14/97. This final report is being issued as per approval received from you and the rest of the CPD leadership staff on Thursday, April 24, 1997. This report has also been reviewed by appropriate CPD and Corporate Environmental Department personnel.

This report documents the reasons why CPD does not need an oil Spill Prevention, Control, and Countermeasure (SPCC) Plan. The Discussion will be kept on file in the Chemistry and Environmental Engineering Department for future reference. In addition to the issuance of the report, the sections of the Emergency Response Plan dealing with the SPCC plan or procedures will be deleted. Oil spill control activities for CPD will be incorporated into an integrated spill response procedure, most likely contained in the Emergency Response Plan. In summary, CPD will have no formal SPCC plan and this report serves as documentation as to the reasons why.

Please let me know if you have any questions.

Discussion of the Need
for an
SPCC Plan at Colstrip Project Division

James M. Parker, P.E.

May 14, 1997

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Discussion of the Need for an SPCC Plan at Colstrip Project Division

Introduction

As per 40CFR 112, certain facilities which store oil on their property are required to write and implement an oil Spill Prevention, Control, and Countermeasure (SPCC) Plan and associated Plans according to the guidelines set forth in 40CFR 112.7. For the purposes of this regulation, "oil" is defined as: " Oil means oil of any kind or in any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse and oil mixed with wastes other than dredged spoil." (40CFR112.2). Section 112.1(d)(1)(i), in setting forth guidance about the type of facilities which are exempt from the requirement to implement the SPCC Plan states:

"112.1(d)(1)(i). Onshore and offshore facilities, which, due to their location, could not reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines. This determination shall be based solely upon a consideration of the geographical, locational aspects of the facility (such as proximity to navigable waters or adjoining shorelines, land contour, drainage, etc.) and shall exclude consideration of manmade features such as dikes, equipment or other structures which may serve to restrain, hinder, contain, or otherwise prevent a discharge of oil from reaching navigable waters of the United States of adjoining shorelines..."

Further guidance is given in 112.1(d)(2)(i) and (ii) regarding the capacity of oil storage at a facility below which no SPCC plan is needed. The sections state:

"112.1(d)(2)(i). The underground buried storage capacity of the facility is 42,000 gallons or less of oil, and

112.1(d)(2)(ii). The storage capacity, which is not buried, of the facility is 1,320 gallons or less of oil, provided no single container has a capacity in excess of 660 gallons."

Considering only storage capacity, CPD would fall under the SPCC requirements due to above ground storage capacity of oil or oil related products. Five tanks are responsible for this storage capacity: two startup fuel storage tanks for Units 3&4; Units 1&2 turbine lube oil tank; and the two Units 3&4 turbine lube oil tanks. The underground storage capacity is below 42,000 gallons of oil. The Nichols dredge station is considered a separate facility and does not store oil in quantities sufficient to make the SPCC regulations applicable.

Oil storage capacity alone does not make an SPCC plan necessary. What needs to be determined next is whether the oil or oil products, if spilled, could reasonably be expected to enter a navigable waterway. CPD has a navigable

waterway in proximity. This waterway is Armells Creek, considered navigable because it is a tributary of a navigable waterway, the Yellowstone River, 30 miles to the north. So the basic question in determining the need for an SPCC plan at CPD is: " Would a spill of some or all of the contents of the Unit 3&4 startup fuel tanks, Units 1&2 turbine lube oil tank, or the two Units 3&4 turbine lube oil tanks reasonably be expected to result in these products entering Armells Creek? "

The July, 1985 Colstrip SPCC plan, issued as CPD procedure 6.5 (and since incorporated into the Emergency Response Plan) was written based upon a negative answer to the question above and essentially said in writing that no SPCC plan was needed. Those responsible for Procedure 6.5 intuitively determined that the oil at CPD could not be reasonably expected to enter Armells Creek if spilled. Since then, that determination and resulting CPD Procedure have been brought into question, mainly by the Corporate Environmental group. This discussion addresses again, in an attempt to answer definitively, the question of reasonability when it comes to expectations that a spill of petroleum products from the aforementioned tanks would enter Armells Creek.

Analysis of Data Available Prior to November, 1996

The tanks in question have the following characteristics:

Tank Name	Capacity	Contents	Approximate MPC Coordinates
Unit 3&4 Startup Fuel Tank	500,000 gallons	diesel	N54550' E59250'
Unit 3&4 Startup Fuel Tank	500,000 gallons	diesel	N54550' E59250'
Unit 3&4 Turbine Lube Oil Tank	17,000 gallons	turbine lubricating oil	N53467' E58283'
Unit 3&4 Turbine Lube Oil Tank	17,000 gallons	turbine lubricating oil	N53467' E58283'
Unit 1&2 Turbine Lube Oil Tank	5,770 gallons	turbine lubricating oil	N53433' E57967'

As stated previously, the determination that a spill of petroleum products from CPD plantsite would not be reasonably be expected to enter Armells Creek was based upon intuition. However, this intuition was founded upon general fact. First, the location of the five above ground tanks was considered. These tanks are not adjacent to the creek. The closest points along the creek to the tanks are listed below:

Tank	Approximate MPC Coordinates
Units 3&4 Startup Fuel	N54183' E56450'
Units 1-4 Turbine Lube Oil	N53000' E56550'

Consequently it can be seen that the closest lube oil tank (1&2) to Armells Creek is 1500' away. The Units 3&4 diesel tanks are 2600' from the nearest point of Armells Creek. The distances in question are long enough and the slope gentle enough, with depressions that would tend to contain any spilled liquid, that upon inspection of the area, a reasonable inference could be made that no spill from these tanks would enter the creek. However, no detailed analysis based upon an actual inspection of a topographical map of the area was made.

Another fact considered in this assessment was that no such catastrophic event as a spill of this magnitude had occurred. This fact may not have been that significant in 1985, but no spill of significance from these tanks has occurred since then. Therefore, the timeframe for this consideration has expanded to nearly 15 years on 3&4 and nearly 21 on 1&2. With a record of this magnitude without a spill from these vessels, the assumption that one will never occur becomes safer.

Analysis of New Data

The main concerns raised about the decision to not implement an SPCC plan were centered on the contention that, without documentation, just saying a plan is not necessary does not make it so in fact. This concern was discussed in depth with the EPA and corporate environmental group throughout 1995 and early 1996. The topic was also discussed during the October, 1996 audit of the CPD by the Corporate Environmental group. The conclusion from these discussions was that if a topographical map of the parts of the Division in question was available, the case for not needing a plan based upon location and topographical features could be documented. At the same time, such a map would also demonstrate the need for such plan if in fact the initial intuitive determination was incorrect. So, the completion

of a topographical map of the current topography of the Colstrip plantsite was commissioned in June, 1996.

The map was completed in October, 1996 and observations of the map and of field conditions were made in October and November, 1996 to determine need for the SPCC plan.

As stated previously, the critical factor in the determination for need had now been distilled to whether or not a spill of oil from any of the five tanks in question could be reasonably expected to enter Armells Creek. The regulations place certain restrictions, as stated below, on the factors to be considered in attempting to answer this question:

"This determination shall be based solely upon a consideration of the geographical, locational aspects of the facility (such as proximity to navigable waters or adjoining shorelines, land contour, drainage, etc.) and shall exclude consideration of manmade features such as dikes, equipment or other structures which may serve to restrain, hinder, contain, or otherwise prevent a discharge of oil from reaching navigable waters of the United States or adjoining shorelines;"

These restrictions were factored into the map review and field observations of October and November. For example, the diesel tanks have a bermed area surrounding them specifically designed to contain at least the full contents of the tanks. Even though the berms are intact and in reality would contain the spilled contents of the tanks, these berms were considered non-existent for the purposes of the investigation. Likewise, the plant is designed as a zero discharge facility. As such there is a complex system of drainage trenches surrounding the facilities that serve to direct any potential discharge to sealed lined ponds. These trenches were also discounted for this determination. Land drainage and topographical characteristics were the only factors considered.

It must be noted that the drainage and topographical features of Colstrip at this point in time are extensively man made. This fact is due to the mining and construction activities of the past. However, these features are permanent enough to meet the intent of the restrictions on consideration of man made features, which is to avoid reliance on features that could fail and result in a spill entering navigable waters. The features considered in this determination will not fail in the same sense that dikes, equipment, and structures will fail; instead, they are a permanent part of the Colstrip landscape and will effect a spill of oil as envisioned and described in the same fashion as natural topography and drainage patterns.

Units 3&4 Startup Fuel Tanks

The two Units 3&4 startup fuel tanks offer the greatest concern for a spill to enter Armells Creek because of their size. In determining the reasonableness of the expectation that a spill from these tanks would enter Armells Creek, a two part approach was used. First, the topographical map was reviewed to determine potential flow areas for a spill from these tanks. Then a field observation was undertaken to rank the flow paths as to the likelihood of use during a spill incident.

Three likely routes that a spill would follow were determined. They are illustrated on the accompanying figure (#1), which is taken from the June, 1996 topographical map of the Colstrip plantsite. They are as follows, in order of likelihood:

1. East by Northeast, toward the Units 3&4 Cooling Towers.
 2. West by Southwest, toward the Colstrip Warehouse.
 3. South by Southwest, toward the Colstrip plantsite.
- These areas are discussed in detail below.

1. East by Northeast, toward the Units 3&4 Cooling Towers.

The fuel tanks sit on a slight north/south ridge as seen on the map. The elevation at the base of the tanks is 3259'. Ground surface elevations at points east and west surrounding these tanks are lower than 3259'. On paper, a spill could conceivably travel either to the west or east. However, field inspection shows that the tanks actually are situated slightly to the East of the crest of the rise. The land also slopes to the south, down the road running between the cooling tower canals and the North Plant Sediment pond. The tanks sit slightly north of the crest of this drainage pattern. Consequently, spilled material will run to the northeast and most likely collect in the small water filled depression between the tanks and the old county landfill. Upon filling the depression area, the spill would then fill the area between the tanks and the cooling towers and adjacent to the cooling towers. As a result of the land contours, the material would be contained in this area or be prone to flowing farther East.

The total capacity of this containment area is difficult to assess exactly but depending upon the depth of liquid contained is estimated in the range of 1,200,000¹ gallons

¹ This area contains a pond. The storage capacity of this pond was estimated with 5' of liquid.

(1" average coverage) to 11,500,000² gallons (2' average coverage), more than enough to contain the total contents of both startup tanks.

2. West by Southwest, toward the Colstrip Warehouse.

Imagining a worst case scenario, where the spill has impetus enough to overcome topography and overflow the crests of the small rises in topography (i.e. - "flow uphill"), the more probable area this would happen is West of the tanks. The tanks are closer to the top of the North/South crest than to the East/West crest. Consequently a spill of this sort would travel to the Warehouse area. The spill would collect in and flow through the area adjacent to and due south of the Warehouse facilities. Liquid that did not collect in this area would drain to the West and eventually collect in the pond between the Warehouse and Power Road, where it would be completely contained. The storage capacity of this area is estimated to be between 2,500,000 gallons³ (1" average coverage) and 10,000,000 gallons⁴ (2' average coverage), again more than enough to contain both tanks' contents.

3. South by Southwest, toward the Colstrip plantsite.

Although highly unlikely to occur, a spill from these tanks flowing through this area was also evaluated. The spill would most probably tend to collect in the areas southwest of the tanks, including the North Plant Drain Pond⁵. Upon overflowing this area, it would tend to collect in the main plant area, to the East and Northwest of the Units. The total capacity of this area is estimated to be from 1,700,000 gallons (1" average coverage) to 23,500,000 gallons (2' average coverage). Thus the contents of both startup tanks would easily be contained in this area.

For all three evaluated spill collection areas, it is evident that the contents of all the tanks would be contained well before reaching Armells Creek and allow cleanup measures to proceed. The expectation of the spill entering Armells Creek is not a reasonable expectation.

² Ditto

³ Ditto

⁴ Ditto

⁵ Ditto

For estimating the capacity of the area, the pond was assumed to hold 5' of spilled material.

Turbine Lube Oil Tanks

These tanks are considered together for evaluating the reasonableness of the expectation that a spill would enter Armells Creek. The containment structures around the tanks, although concrete and highly unlikely to fail, were discounted in this evaluation.

The area potentially impacted by a spill from either of these tanks is relatively flat and it is hard to predict which direction a spill would take. The potentially impacted area is illustrated on the attached figure (#2) and is large in relation to the contents of the tanks. It would more than contain the total contents of all 3 tanks. The storage volume ranges from 664,000 gallons (1" average coverage) to 15,900,000 gallons (2' average coverage). There are several depressions in the ground contour near the tanks in question and it is most likely that the contents of a spill from these tanks would collect and be contained in these depressions. However, even if the tank contents flow past these depressions, it will be more than contained in the illustrated area, whose boundaries are not close to Armells Creek, and whose storage capacity is at a minimum, 17 times greater than the total contents of the 3 lube oil tanks.

Discounting the depressions noted above, and assuming that the spill flows un-contained, it is highly probable given the relative flatness of the terrain that the liquid would follow a generally concentric circular pattern surrounding the tanks. The concentric circle enclosing a surface area which would contain six tank volumes (at 1" average coverage) is still 1350 feet from the nearest point of entry into Armells Creek. This occurs for the units 1&2 turbine lube oil tank (See Figure #2). Consequently, it is a reasonable to conclude that no spill from these tanks would reach Armells Creek.

Conclusions

The existing permanent topography and location of the pertinent oil storage tanks relative to the most likely points of entry into Armells Creek are such as to preclude a spill from entering the creek. In the case of the Units 3&4 startup fuel tanks, the most likely route for a spill to follow is away from the creek. For the Units 1&2 and Units 3&4 lube oil tanks, the topography is nearly flat and the tank contents will be contained in a relatively large area well away from Armells Creek. Based upon the above analyses, it is reasonable to conclude that the potential for a spill from either the Units 3&4 startup fuel tanks or the Units 1-4 turbine lube oil tanks to enter Armells Creek is

nonexistent. Therefore, there is no reasonable expectation that a spill would enter Armells Creek and as per 40CFR 112.1(d)(1)(i), CPD is exempt from needing an SPCC Plan.

Table 1
Discussion of the Need for an SPPC Plan at Colstrip Project Division
Area Holding Capacities

Spill Path	Land Section	Dimensions - sh-long Inches	Dimensions - sh-long Feet	Shape	Area (ft ²)	Capacity per cover (Gal)	1"	6"	1'	2'	User's Choice (ft)	5	Totals	1"	6"	1'	2'
DT1 (red)	1	1.625	2.1875	650	568750	354545	2127270	4254540	8509080	21272700	0	1218301	3452669	6133910	11496393		
DT1 (red)	2	0.25	0.8125	100	16250	10129.86	60779.14	121558.3	243116.6	607791.4	0	0	0	0	0	0	0
DT1 (red)	3	0.25	0.5625	100	11250	7012.978	42077.87	84155.74	168311.5	420778.7	0	0	0	0	0	0	0
DT1 (red)	4	0.375	0.5625	150	16875	10519.47	63116.8	126233.6	252467.2	631168	0	0	0	0	0	0	0
DT1 (red)	5	0.375	0.75	150	22500	14025.96	84155.74	168311.5	336623	841557.4	0	0	0	0	0	0	0
DT1 (red)	6	0.375	0.9375	150	28125	17532.45	105194.7	210389.3	420778.7	1051947	0	0	0	0	0	0	0
DT1 (red)	7	0.9375	2.375	375	178125	111038.8	666232.9	1332466	2664932	6662329	0	0	0	0	0	0	0
DT1 (red)	8	0.125	1.375	50	13750	8571.418	51428.51	102857	205714	514285.1	0	0	0	0	0	0	0
DT1 (red)	9	0.125	1.1875	50	11875	7402.588	44415.53	88831.06	177662.1	444155.3	0	0	0	0	0	0	0
DT1 (red)	10	0.625		250	-49087.5	-30600	-183600	-367200	-734399	-1835998	0	0	0	0	0	0	0
DT1 (red)	11	0.625		250	-13125	-8181.81	-49090.8	-98181.7	-196363	-490908	0	0	0	0	0	0	0
DT1 (red)	12	-0.1875	0.4375	-75	175 rectangle	-5625	-3508.49	-21038.9	-42077.9	-84155.7	0	0	0	0	0	0	0
DT1 (red)	13	-0.1875	0.1875	-75	50 rectangle	-2500	-1558.44	-9350.64	-18701.3	-37403.6	0	0	0	0	0	0	0
DT1 (red)	14	-0.125	0.125	-50	37.5 rectangle	-937.5	-584.415	-3506.49	-7012.98	-14026	0	0	0	0	0	0	0
DT1 (red)	15	-0.0625	0.09375	-25	25 rectangle	-625	-389.61	-2337.66	-4675.32	-9350.64	0	0	0	0	0	0	0
DT1 (red)	16	-0.0625	0.125	-25	50 rectangle	-1250	-779.22	-4675.32	-9350.64	-18701.3	0	0	0	0	0	0	0
DT1 (red)	17	-0.0625	0.0625	-25	25 rectangle	-625	-389.61	-2337.66	-4675.32	-9350.64	0	0	0	0	0	0	0
DT1 (red)	18	0.09375		37.5	0 circle	-1104.47	-688.499	-4130.99	-8261.99	-16524	0	0	0	0	0	0	0
DT1 (red)	19	0.125		50	0 circle	-1963.5	-1224	-7343.99	-14688	-29376	0	0	0	0	0	0	0
DT1 (red)	20	0.125		50	0 circle	-1963.5	-1224	-7343.99	-14688	-29376	0	0	0	0	0	0	0
DT1 (red)	21	0.1875	0.6875	75	275 rectangle	20625	12857.13	77142.76	154285.5	308571	0	0	0	0	0	0	0
DT1 (red)	22	-0.03125		-12.5	0 circle	-122.719	-76.4999	-458.999	-917.999	-1836	0	0	0	0	0	0	0
DT1 (red)	23	-0.03125		-12.5	0 circle	-122.719	-76.4999	-458.999	-917.999	-1836	0	0	0	0	0	0	0
DT1 (red)	24	-0.0625	0.15625	-25	62.5 rectangle	-1562.5	-974.025	-5844.15	-11688.3	-23376.6	0	0	0	0	0	0	0
DT1 (red)	25	-0.0625	0.09375	-25	37.5 rectangle	-937.5	-584.415	-3506.49	-7012.98	-14026	0	0	0	0	0	0	0
DT1 (red)	26			0	0	0	0	0	0	0	0	0	0	0	0	0	0
DT2 (Green)	1	1.25	2.25	500	450000	280519.1	1683115	3366230	6732459	16831149	0	2568114	4187917	6131681	10018208		
DT2 (Green)	2	0.5	1	200	80000	49870.07	299220.4	598440.8	1196882	2992204	0	0	0	0	0	0	0
DT2 (Green)	3	0.5	1.25	200	50000	31168.79	187012.8	374025.5	748051	1870128	0	0	0	0	0	0	0
DT2 (Green)	4	0.375	0.875	150	26250	16363.62	98181.08	196363.2	392726.8	981816.9	0	0	0	0	0	0	0
DT2 (Green)	5	0.375	0.1875	150	11250	7012.978	42077.87	84155.74	168311.5	420778.7	0	0	0	0	0	0	0
DT2 (Green)	6	0.375	1	150	80000	37402.55	224415.3	448830.6	897661.2	2244153	0	0	0	0	0	0	0
DT2 (Green)	7	-0.625	0.875	-250	-87500	-54545.4	-32727.2	-65454.6	-130908.9	-327272.3	0	0	0	0	0	0	0
DT2 (Green)	8	-0.125	0.15625	-50	-3125	-1948.05	-11688.3	-23376.6	-46753.2	-116883	0	0	0	0	0	0	0
DT2 (Green)	9	-0.03125	0.0625	-12.5	-62.5 rectangle	-1562.5	-974.025	-5844.15	-11688.3	-23376.6	0	0	0	0	0	0	0
DT2 (Green)	10	-0.0625	0.1875	-25	75 rectangle	-1875	-1168.83	-7012.98	-14026	-28051.9	0	0	0	0	0	0	0
DT2 (Green)	11	-0.125	0.25	-50	100 rectangle	-5000	-3116.86	-18701.3	-37402.6	-74805.1	0	0	0	0	0	0	0
DT2 (Green)	12			0	0	0	0	0	0	0	0	0	0	0	0	0	0
DT3 (Purple)	1	1.5	3.25	600	780000	486233.2	2917399	5834798	11669596	29173989	0	1761845	6480166	12142151	23466122		
DT3 (Purple)	2	0.75	0.96875	300	116250	72467.44	434804.6	869609.3	1739219	4348046	0	0	0	0	0	0	0
DT3 (Purple)	3	0.75	1.6875	300	101250	63116.8	378700.8	757401.6	1514803	3787008	0	0	0	0	0	0	0
DT3 (Purple)	4	0.21875	0.625	87.5	21875	13636.35	81818.08	163636.2	327272.3	818180.8	0	0	0	0	0	0	0
DT3 (Purple)	5	0.21875	0.25	87.5	8750	5454.539	32727.23	65454.46	130908.9	327272.3	0	0	0	0	0	0	0
DT3 (Purple)	6	0.125	0.875	50	17500	10909.08	65454.46	130908.9	261817.9	654544.6	0	0	0	0	0	0	0
DT3 (Purple)	7	0.4375	1.75	175	122500	76363.54	458181.2	916362.5	1832725	4581812	0	0	0	0	0	0	0
DT3 (Purple)	8	0.6875	1.125	275	61875	38571.38	231428.3	462856.6	925713.1	2314283	0	0	0	0	0	0	0
DT3 (Purple)	9	0.25	0.6875	100	13750	8571.418	51428.51	102857	205714	514285.1	0	0	0	0	0	0	0
DT3 (Purple)	10	0.25	0.5625	100	11250	7012.978	42077.87	84155.74	168311.5	420778.7	0	0	0	0	0	0	0
DT3 (Purple)	11	1.0625	1.875	425	318750	198701	1192206	2384413	4768825	11922063	0	0	0	0	0	0	0

Table 1
Discussion of the Need for an SPCC Plan at Colstrip Project Division
Area Holding Capacities

Spill Path	Land Section	Dimensions - sh, long		Dimensions - sh, long		Shape	Area		Capacity per cover (Gall)		User's Choice (ft)		Totals	
		Inches	Feet	Inches	Feet		(ft2)	1'	6'	1'	6'	1'	6'	1'
OT3(Purple)	12	0.1875	1.142857	75	457.1429	triangle	17142.86	10686.44	64118.66	128237.3	256474.6	641186.6	0	2'
OT3(Purple)	13	0.1875	0.75	75	300	triangle	11250	7012.978	42077.87	84155.74	168311.5	420778.7	0	
OT3(Purple)	14	0.6875	1.4375	275	575	triangle	79062.5	49285.65	295713.9	591427.8	118285.6	2957139	0	
OT3(Purple)	15	-0.09375	0.09375	37.5	37.5	rectangle	-1406.25	-876.622	-5259.73	-10519.5	-21038.9	-52597.3	0	
OT3(Purple)	16	0.09375	0.09375	37.5	37.5	rectangle	-1104.47	-688.499	-4130.99	-8261.99	-16524	-41309.9	0	
OT3(Purple)	17	0.09375	0.09375	37.5	37.5	rectangle	-1104.47	-688.499	-4130.99	-8261.99	-16524	-41309.9	0	
OT3(Purple)	18	0.0625	0.0625	25	25	rectangle	-490.875	-306	-1836	-3672	-7343.99	-18360	0	
OT3(Purple)	19	0.125	0.125	50	50	rectangle	-1963.5	-1224	-7343.99	-14688	-29376	-73439.9	0	
OT3(Purple)	20	-0.21875	0.25	-87.5	100	rectangle	-8750	-5454.54	-32727.2	-65454.5	-130909	-327272	0	
OT3(Purple)	21	-0.21875	0.25	-87.5	100	rectangle	-8750	-5454.54	-32727.2	-65454.5	-130909	-327272	0	
OT3(Purple)	22	-0.09375	0.09375	-37.5	37.5	rectangle	-1406.25	-876.622	-5259.73	-10519.5	-21038.9	-52597.3	0	
OT3(Purple)	23	-0.03125	0.03125	-12.5	12.5	rectangle	-156.25	-97.4025	-584.415	-1168.83	-2337.66	-5844.15	0	
OT3(Purple)	24	-0.03125	0.03125	-12.5	12.5	rectangle	-156.25	-97.4025	-584.415	-1168.83	-2337.66	-5844.15	0	
OT3(Purple)	25	0.03125	0.03125	12.5	12.5	rectangle	-122.719	-76.4999	-458.999	-917.999	-1836	-4589.99	0	
OT3(Purple)	26	0.03125	0.03125	12.5	12.5	rectangle	-122.719	-76.4999	-458.999	-917.999	-1836	-4589.99	0	
OT3(Purple)	27	-0.125	0.125	-50	50	rectangle	-2500	-1558.44	-9350.64	-18701.3	-37402.6	-93506.4	0	
OT3(Purple)	28	-0.03125	0.125	-12.5	50	rectangle	-625	-389.61	-2337.66	-4675.32	-9350.64	-23376.6	0	
OT3(Purple)	29	-0.0625	0.09375	-25	37.5	rectangle	-937.5	-584.415	-3506.49	-7012.96	-14026	-35064.9	0	
OT3(Purple)	30	-0.375	0.9375	-150	375	rectangle	-56250	-35064.9	-210389	-420779	-841557	-2103893	0	
OT3(Purple)	31	-0.375	0.9375	-150	200	rectangle	-30000	-18701.3	-112208	-224415	-448831	-1122077	0	
OT3(Purple)	32	-0.16625	0.3125	-62.5	125	rectangle	-7812.5	-4870.12	-29220.7	-58441.5	-116883	-292207	0	
OT3(Purple)	33	0	0	0	0	rectangle	0	0	0	0	0	0	0	
LOT(RED)	1	0.625	2	250	800	triangle	100000	62337.58	374025.5	748051	1496102	3740255	0	
LOT(RED)	2	1	2	400	800	rectangle	320000	199480.3	1196882	2393763	4787526	11968816	0	
LOT(RED)	3	0.4375	0.9375	175	375	triangle	32812.5	20454.52	122727.1	245454.2	490908.5	1227271	0	
LOT(RED)	4	0.75	2	300	800	triangle	120000	74805.1	448830.6	897661.2	1795332	4488306	0	
LOT(RED)	5	1.1875	1.125	475	450	rectangle	213750	133246.6	599479.5	1599959	3197918	7994795	0	
LOT(RED)	6	0.3125	1.375	125	550	triangle	34375	21428.54	128571.3	257142.5	514285.1	1285713	0	
LOT(RED)	7	0.3125	1.8125	125	725	triangle	45312.5	28246.72	169480.3	338960.6	677921.2	1694803	0	
LOT(RED)	8	0.3125	0.4375	125	175	rectangle	21875	13636.35	81818.08	163636.2	327272.3	818180.8	0	
LOT(RED)	9	0.09375	0.09375	37.5	37.5	rectangle	-1104.47	-688.499	-4130.99	-8261.99	-16524	-41309.9	0	
LOT(RED)	10	0.09375	0.09375	37.5	37.5	rectangle	-1104.47	-688.499	-4130.99	-8261.99	-16524	-41309.9	0	
LOT(RED)	11	0.03125	0.03125	12.5	12.5	rectangle	-122.719	-76.4999	-458.999	-917.999	-1836	-4589.99	0	
LOT(RED)	12	0.03125	0.03125	12.5	12.5	rectangle	-122.719	-76.4999	-458.999	-917.999	-1836	-4589.99	0	
LOT(RED)	13	0.09375	0.09375	37.5	37.5	rectangle	-1104.47	-688.499	-4130.99	-8261.99	-16524	-41309.9	0	
LOT(RED)	14	0.125	0.125	50	50	rectangle	-1963.5	-1224	-7343.99	-14688	-29376	-73439.9	0	
LOT(RED)	15	-0.21875	0.25	-87.5	100	rectangle	-8750	-5454.54	-32727.2	-65454.5	-130909	-327272	0	
LOT(RED)	16	-0.21875	0.25	-87.5	100	rectangle	-8750	-5454.54	-32727.2	-65454.5	-130909	-327272	0	
LOT(RED)	17	-0.0625	0.0625	-25	25	rectangle	-625	-389.61	-2337.66	-4675.32	-9350.64	-23376.6	0	
LOT(RED)	18	-0.03125	0.125	-12.5	50	rectangle	-625	-389.61	-2337.66	-4675.32	-9350.64	-23376.6	0	
LOT(RED)	19	-0.21875	0.34375	-87.5	137.5	rectangle	-12031.3	-7499.99	-44999.9	-89999.9	-180000	-449999	0	
LOT(RED)	20	-0.15625	0.3125	-62.5	125	rectangle	-7812.5	-4870.12	-29220.7	-58441.5	-116883	-292207	0	
LOT(RED)	21	-0.1875	0.375	-75	150	rectangle	-11750	-7012.98	-42077.9	-84155.7	-168311	-420779	0	
LOT(RED)	22	-0.1875	0.625	-75	250	rectangle	-18750	-11688.3	-70129.8	-140260	-280519	-701298	0	
LOT(RED)	23	-0.09375	0.09375	-37.5	37.5	rectangle	-1406.25	-876.622	-5259.73	-10519.5	-21038.9	-52597.3	0	
LOT(RED)	24	-0.09375	0.09375	-37.5	37.5	rectangle	-1406.25	-876.622	-5259.73	-10519.5	-21038.9	-52597.3	0	
LOT(RED)	25	-0.125	0.125	-50	50	rectangle	-2500	-1558.44	-9350.64	-18701.3	-37402.6	-93506.4	0	
LOT(RED)	26	-0.03125	0.03125	-12.5	12.5	rectangle	-156.25	-97.4025	-584.415	-1168.83	-2337.66	-5844.15	0	
LOT(RED)	27	0.25	0.375	100	150	rectangle	15000	9350.638	56103.83	112207.7	224415.3	561038.3	0	
LOT(RED)	28	0.5625	2.6875	225	1075	rectangle	241875	150779	904674.2	1809348	3618697	9046742	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
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				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
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				0	0	rectangle	0	0	0	0	0	0	0	
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				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0	0	0	0	0	0	0	
				0	0	rectangle	0							

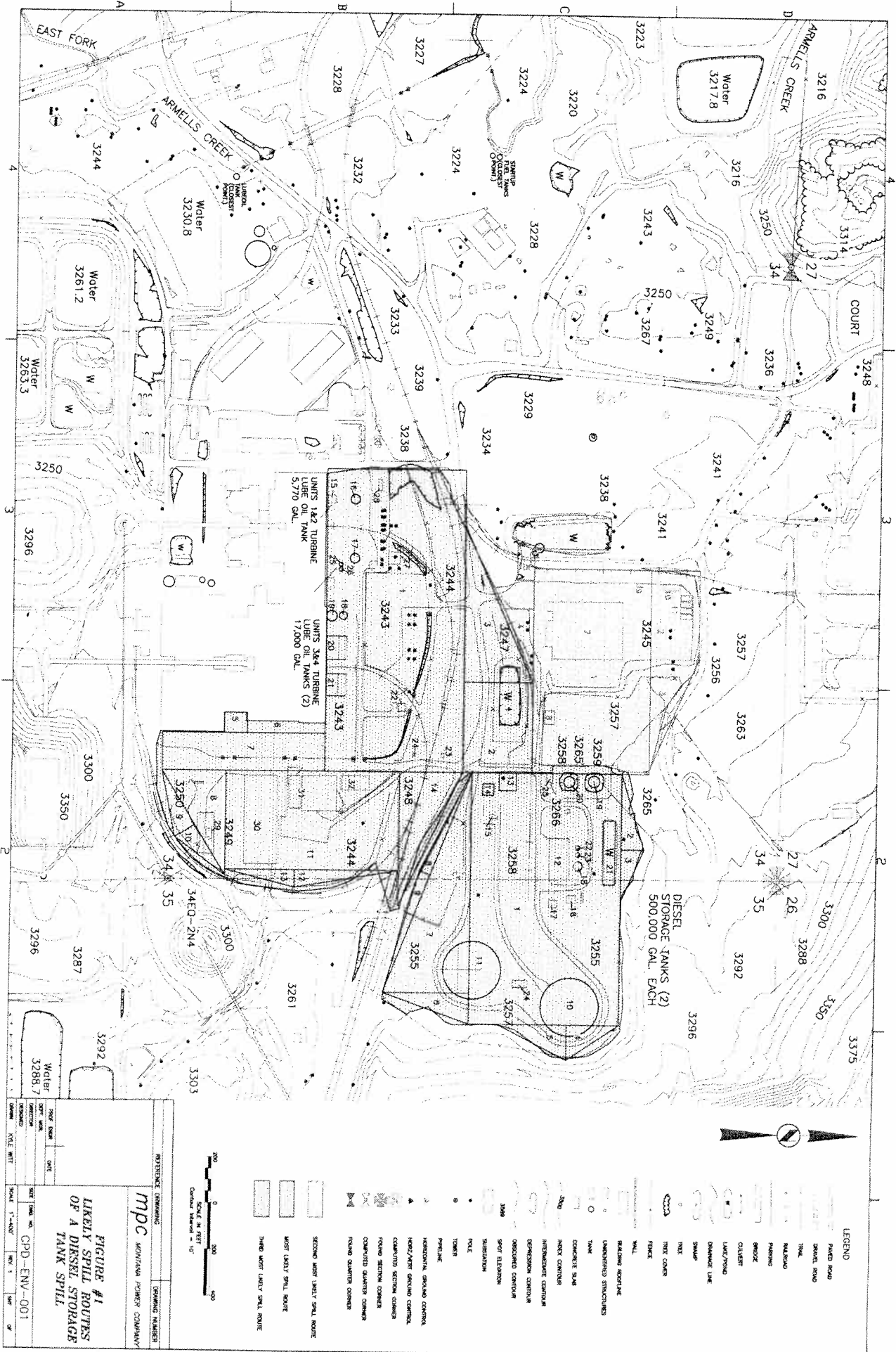
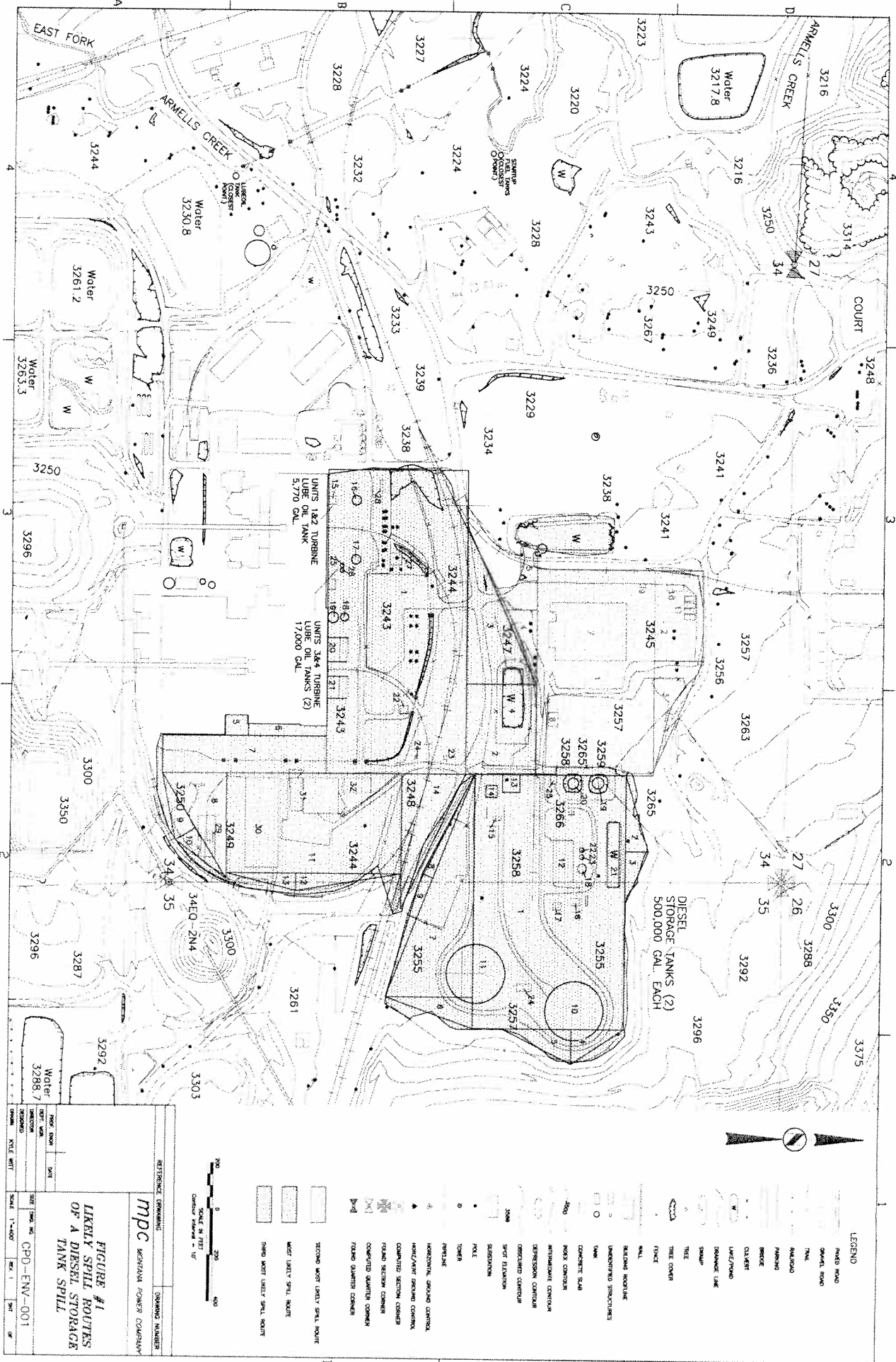
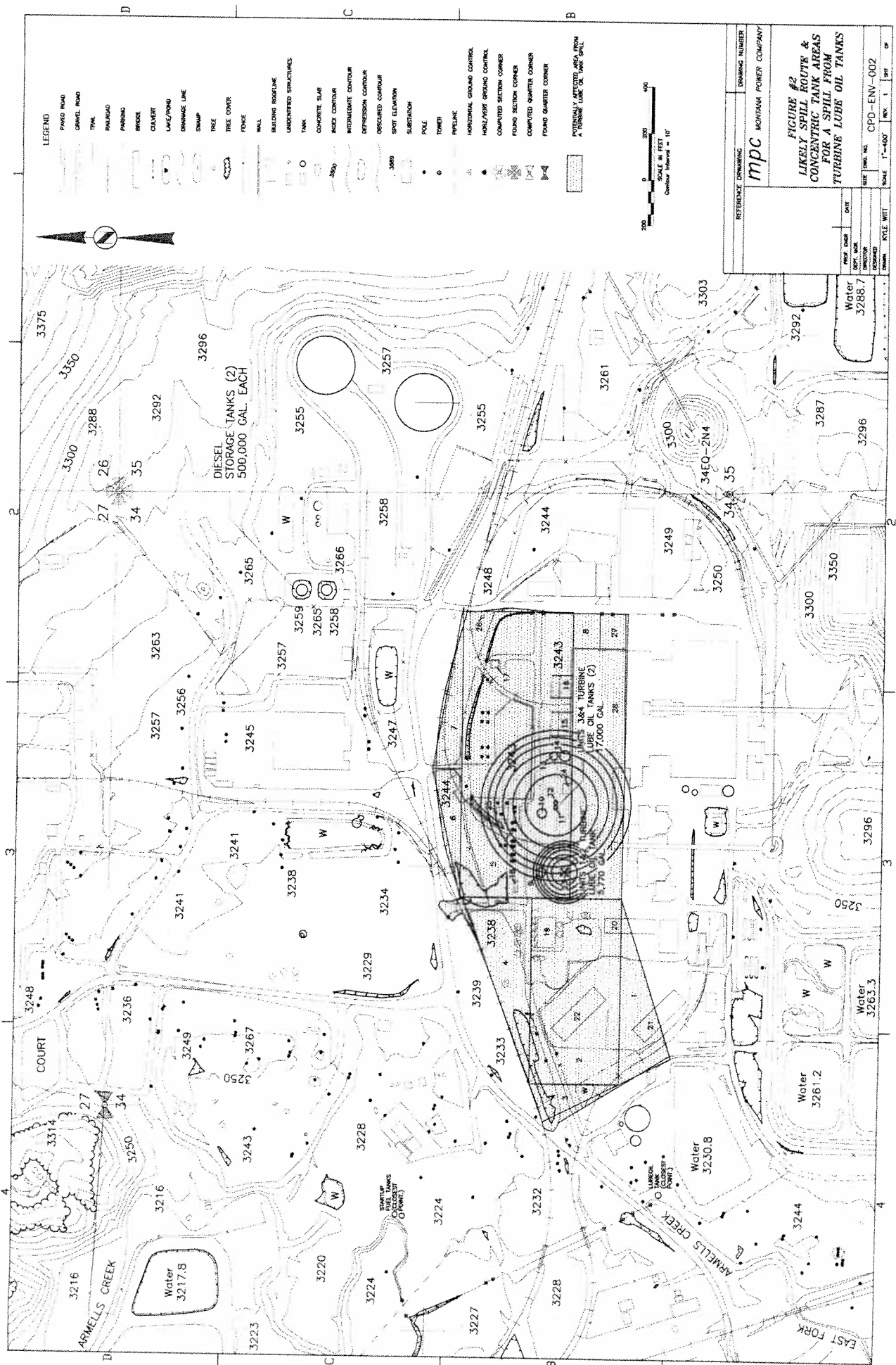


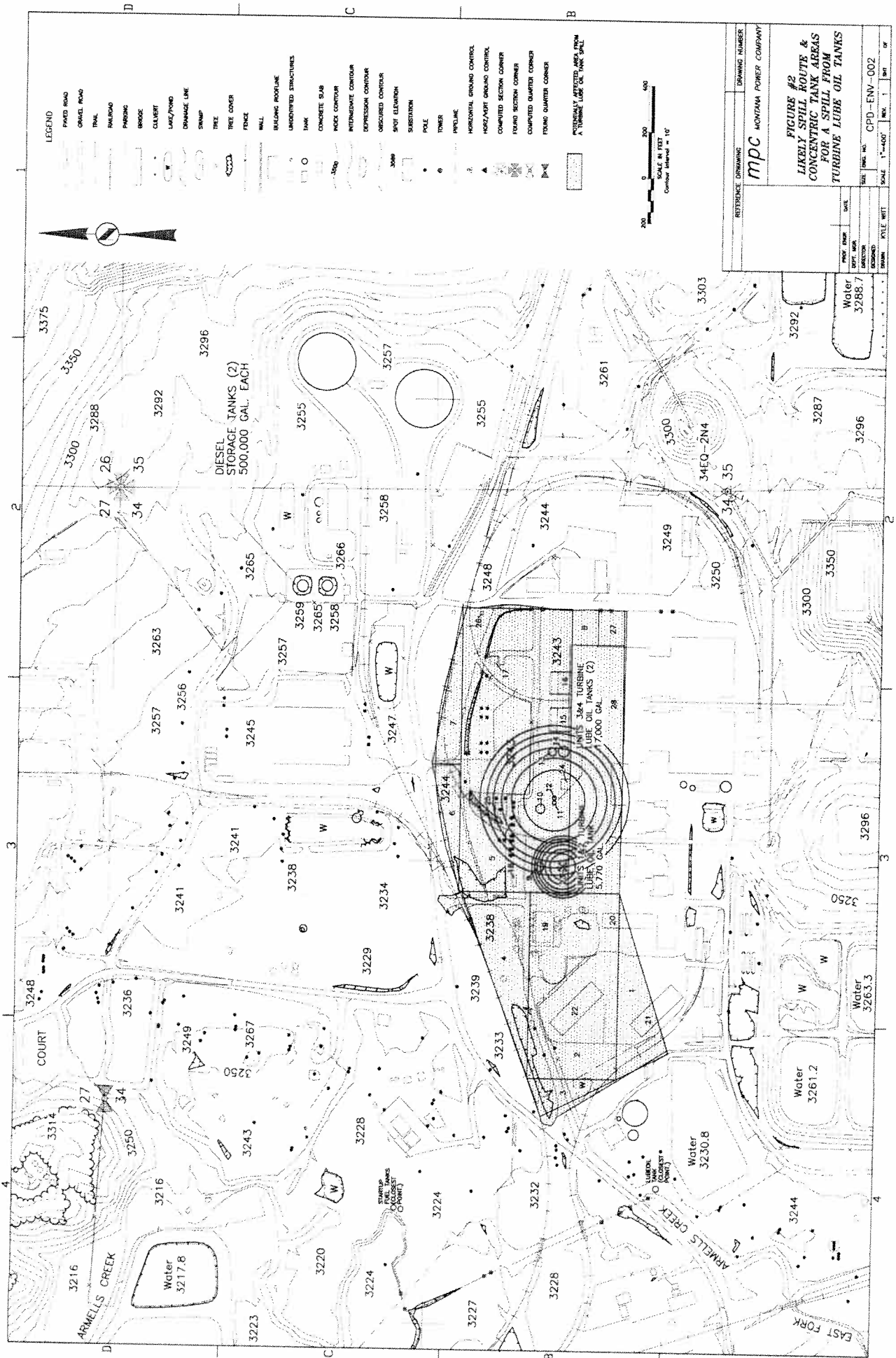
FIGURE #1
LIKELY SPILL ROUTES
OF A DIESEL STORAGE
TANK SPILL

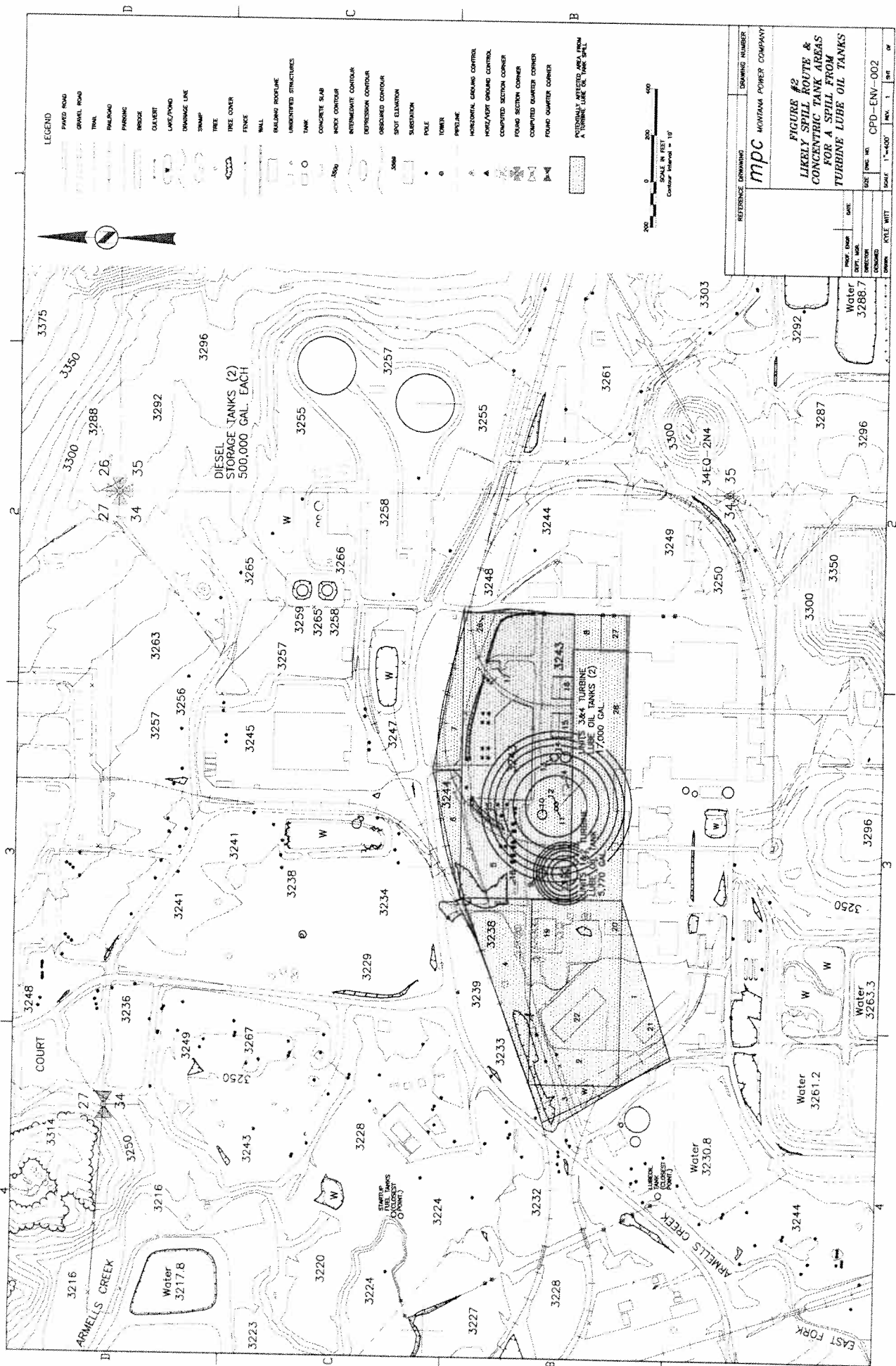
mpc
MONTANA POWER COMPANY

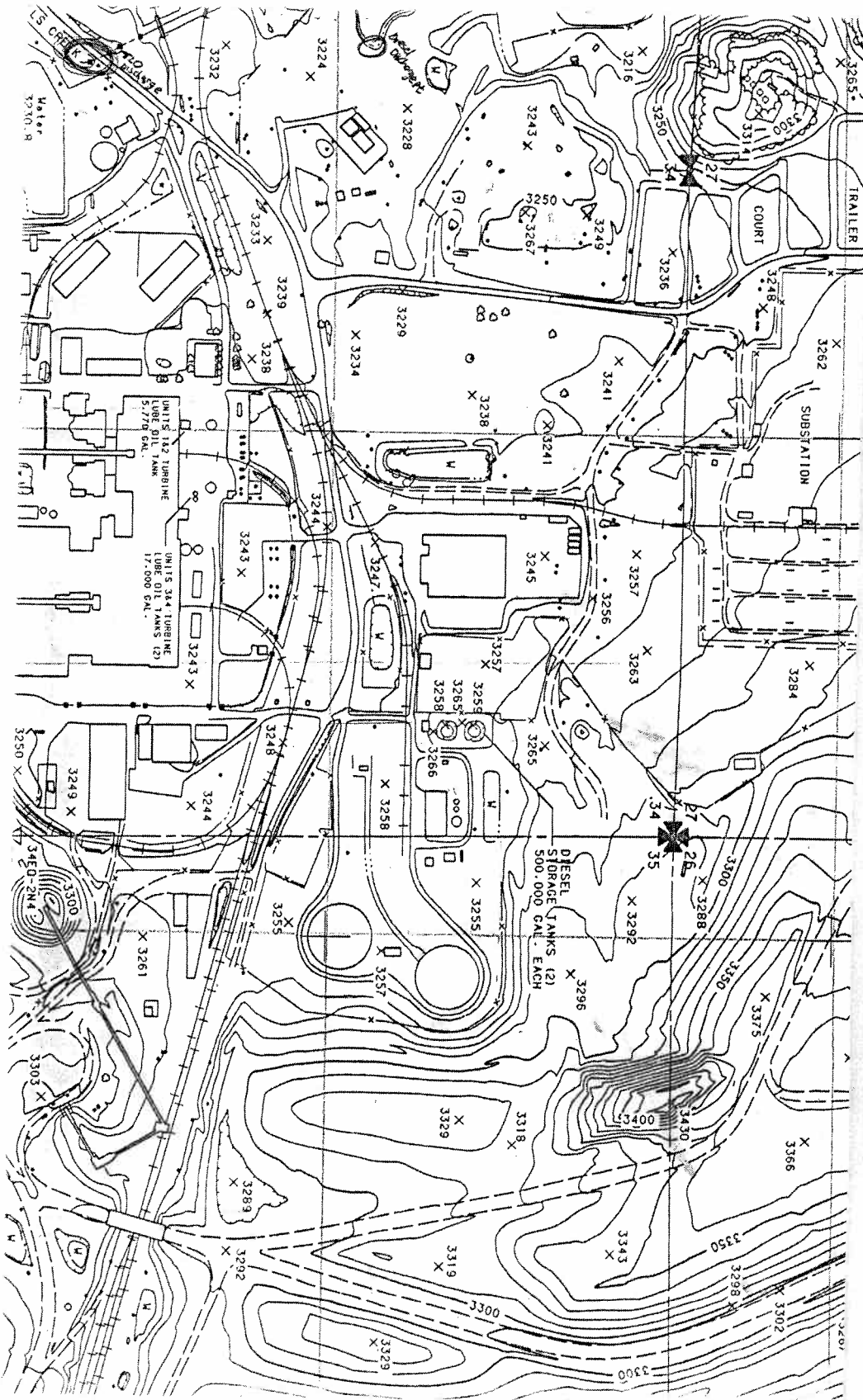
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DATE	BY	DATE	BY
<p>CPD-ENV-001</p>		<p> </p>	











Fax Transmittal Memo 7672
 To Sue Mottello
 Company MPE
 Location Butte
 Fax 497 2149
 Copyright
 From J Porter
 Date 2/19/97
 1403
 Company MPE
 Location Colstrip
 748 5040
 Telephone 2188
 Date Change
 Revision #
 Description
 Call for backup
 Sue - Appreciate your help! Hope you
 can make everything work. If not call.

APPENDIX E

CHAIN OF CUSTODY FORMS

**** Challenge Now Apply to all OF Darkened ****

YELLOW - REPORT

PINK - CLIENT RECEIPT

Page	1	2
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		Baltimore Division Baltimore, MD 21224 Tel: 410-633-1800 Fax: 410-633-6553 www.microbac.com		Sample Submittal Chain of Custody Record		Work Order Number: _____											
		Page <u>1</u> of <u>1</u>															
Client Name <u>SAIC</u>		Project <u>EPA CCW</u>		Turnaround Time (Required)		QC and EDD Type (Required)											
Address <u>12100 Sunset Hills Rd</u>		Location <u>Montana</u>		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> RUSH* (notify lab) _____ (needed by)		<input type="checkbox"/> Level I (NAC) <input type="checkbox"/> Level II ** <input checked="" type="checkbox"/> Level III ** <input type="checkbox"/> Level IV **											
City, State, Zip <u>Reston, VA 20190</u>		PO # _____				Format: <u>Excel</u>											
Contact <u>Brandon Keebles</u>		Compliance Monitoring? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Comments: _____													
Telephone # <u>703-375-2264</u>		(1) Agency/Program <u>EPA</u>															
Sampled by (PRINT) <u>Brandon Keebles</u>		Sampler Signature <u>[Signature]</u>		Sampler Phone # <u>703-375-2264</u>													
Send Report via <input checked="" type="checkbox"/> e-mail (address) <u>brakebles@saic.com</u>		<input checked="" type="checkbox"/> Mail <input type="checkbox"/> Telephone <input type="checkbox"/> Fax (fax #) _____															
* Matrix Types: Soil/Solid (S), Sludge, Oil, Wipe, Drinking Water (DW), Groundwater (GW), Surface Water (SW), Waste Water (WW), Other (specify)																	
Client Sample ID		Matrix*	Grab	Composite	Filtered	Date Collected	Time Collected	No. of Containers	Requested Analysis								Comments
									<div style="display: flex; justify-content: space-around;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TCLP</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">SWOC</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">* Metals</div> </div>								
COW-2		WW	<input checked="" type="checkbox"/>			9/2/09	10:13	7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						* Total Metals
Possible Hazard Identification		<input type="checkbox"/> Hazardous <input checked="" type="checkbox"/> Non-Hazardous <input type="checkbox"/> Radioactive		Sample Disposition		<input checked="" type="checkbox"/> Dispose as appropriate <input type="checkbox"/> Return <input type="checkbox"/> Archive											
Number of Containers: _____		Relinquished By (signature) <u>[Signature]</u>		Printed Name/Affiliation <u>Brandon Keebles</u>		Date/Time <u>9/3/09 13:43 (M)</u>											
Cooler Number: _____		Relinquished By (signature) _____		Printed Name/Affiliation _____		Received By (signature) _____											
Temp upon receipt (°C): _____		Relinquished By (signature) _____		Printed Name/Affiliation _____		Received By (signature) _____											
Sample Received on Ice or Refrigerated from Client: Yes / No		Relinquished By (signature) _____		Printed Name/Affiliation _____		Received for Lab By (signature) _____											

	Baltimore Division Baltimore, MD 21224 Tel: 410-633-1800 Fax: 410-633-6553 www.microbac.com		Sample Submittal Chain of Custody Record		Work Order Number: _____ Page <u>1</u> of <u>1</u>	
	Client Name <u>SAIC</u>		Project <u>EPA CCW</u>		Turnaround Time (Required)	
	Address <u>12100 Sunset Hills Rd</u>		Location <u>Montana</u>		<input checked="" type="checkbox"/> Standard	
City, State, Zip <u>Reston, VA 20190</u>		PO # _____		<input type="checkbox"/> RUSH* (notify lab)		QC and EDD Type (Required)
Contact <u>Brandon Peebles</u>		Compliance Monitoring? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		(needed by) _____		<input type="checkbox"/> Level I (NAC) <input type="checkbox"/> Level II ** <input checked="" type="checkbox"/> Level III ** <input type="checkbox"/> Level IV **
Telephone # <u>703-375-2264</u>		(1) Agency/Program <u>EPA</u>				Format: <u>Excel</u> Comments:
Sampled by (PRINT) <u>Brandon Peebles</u>		Sampler Signature <u>[Signature]</u>		Sampler Phone # <u>703-375-2264</u>		
Send Report via <input checked="" type="checkbox"/> e-mail (address) <u>peeblesb@saic.com</u>		<input checked="" type="checkbox"/> Mail <input type="checkbox"/> Telephone <input type="checkbox"/> Fax (fax #) _____				
* Matrix Types: Soil/Solid (S), Sludge, Oil, Wipe, Drinking Water (DW), Groundwater (GW), Surface Water (SW), Waste Water (WW), Other (specify)						
Requested Analysis						
Client Sample ID	Matrix*	Grab	Composite	Filtered	Date Collected	Time Collected
COW-3	WW	<input checked="" type="checkbox"/>			9/2/09	10:41
						No. of Containers
						7
						TCLP
						SWC
						* Metals
						Requested Analysis
						Comments
						* Total Metals
Possible Hazard Identification <input type="checkbox"/> Hazardous <input checked="" type="checkbox"/> Non-Hazardous <input type="checkbox"/> Radioactive						
Sample Disposition <input checked="" type="checkbox"/> Dispose as appropriate <input type="checkbox"/> Return <input type="checkbox"/> Archive						
Number of Containers: _____ Cooler Number: _____ Temp upon receipt(°C): _____ Sample Received on Ice or Refrigerated from Client: Yes / No	Relinquished By (signature) <u>[Signature]</u>	Printed Name/Affiliation <u>Brandon Peebles</u>	Date/Time <u>9/3/09 13:46 (MT)</u>	Received By (signature) _____	Printed Name/Affiliation	
	Relinquished By (signature) _____	Printed Name/Affiliation	Date/Time	Received By (signature) _____	Printed Name/Affiliation	
	Relinquished By (signature) _____	Printed Name/Affiliation	Date/Time	Received for Lab By (signature) _____	Printed Name/Affiliation	

** Surcharge May Apply to add'l QC Packages **

WHITE - LAB

YELLOW - REPORT

PINK - CLIENT RECEIPT

Page 1 2

Enforcement Confidential

Draft Report

		Baltimore Division Baltimore, MD 21224 Tel: 410-633-1800 Fax: 410-633-6553 www.microbac.com		Sample Submittal Chain of Custody Record		Work Order Number: _____												
		Page <u>1</u> of <u>1</u>																
Client Name <u>SAIC</u>		Project <u>EPA CCW</u>		Turnaround Time (Required)		QC and EDD Type (Required)												
Address <u>12100 Sunset Hills Rd</u>		Location <u>Montana</u>		<input checked="" type="checkbox"/> Standard		<input type="checkbox"/> Level I (NAC)												
City, State, Zip <u>Reston, VA 20190</u>		PO # _____		<input type="checkbox"/> RUSH* (notify lab)		<input type="checkbox"/> Level II **												
Contact <u>Brandon Peebles</u>		Compliance Monitoring? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		(needed by) _____		<input checked="" type="checkbox"/> Level III **												
Telephone # <u>703-375-2264</u>		(1) Agency/Program <u>EPA</u>				<input type="checkbox"/> Level IV **												
Sampled by (PRINT) <u>Brandon Peebles</u>		Sampler Signature <u>[Signature]</u>		Sampler Phone # <u>703-375-2264</u>														
Send Report via <u>e-mail (address) poeblesb@saic.com</u>		[] Mail [] Telephone [] Fax (fax #) _____																
* Matrix Types: Soil/Solid (S), Sludge, Oil, Wipe, Drinking Water (DW), Groundwater (GW), Surface Water (SW), Waste Water (WW), Other (specify) _____																		
Client Sample ID	Matrix*	Grab	Composite	Filtered	Date Collected	Time Collected	No. of Containers	Requested Analysis								Comments		
								TCLP	Volatiles	SVOC	* Metals							
COW-5	WW	<input checked="" type="checkbox"/>			9/2/09	11:49	9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							* Total Metals
Possible Hazard Identification <input type="checkbox"/> Hazardous <input checked="" type="checkbox"/> Non-Hazardous <input type="checkbox"/> Radioactive		Sample Disposition <input checked="" type="checkbox"/> Dispose as appropriate <input type="checkbox"/> Return <input type="checkbox"/> Archive																
Number of Containers: _____		Relinquished By (signature) <u>[Signature]</u>		Printed Name/Affiliation <u>Brandon Peebles</u>		Date/Time <u>9/3/09 13:42 (m)</u>		Received By (signature) _____		Printed Name/Affiliation _____								
Cooler Number: _____		Relinquished By (signature) _____		Printed Name/Affiliation _____		Date/Time _____		Received By (signature) _____		Printed Name/Affiliation _____								
Temp upon receipt ("C): _____		Relinquished By (signature) _____		Printed Name/Affiliation _____		Date/Time _____		Received for Lab By (signature) _____		Printed Name/Affiliation _____								
Sample Received on Ice or Refrigerated from Client: Yes / No		Relinquished By (signature) _____		Printed Name/Affiliation _____		Date/Time _____		Received for Lab By (signature) _____		Printed Name/Affiliation _____								

		Baltimore Division Baltimore, MD 21224 Tel: 410-633-1800 Fax: 410-633-6553 www.microbac.com		Sample Submittal Chain of Custody Record		Work Order Number: _____ Page <u>1</u> of <u>1</u>												
Client Name <u>SAIC</u>		Project <u>EPA CCW</u>		Turnaround Time (Required)		QC and EDD Type (Required)												
Address <u>12100 Sunset Hills Rd</u>		Location <u>Montana</u>		<input checked="" type="checkbox"/> Standard		<input type="checkbox"/> Level I (NAC)												
City, State, Zip <u>Reston, VA 20190</u>		PO # _____		<input type="checkbox"/> RUSH* (notify lab)		<input type="checkbox"/> Level II **												
Contact <u>Brandon Peebles</u>		Compliance Monitoring? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		(needed by) _____		<input checked="" type="checkbox"/> Level III **												
Telephone # <u>703-375-2264</u>		(1) Agency/Program <u>EPA</u>				<input type="checkbox"/> Level IV **												
Sampled by (PRINT) <u>Brandon Peebles</u>		Sampler Signature <u>[Signature]</u>		Sampler Phone # <u>703-375-2264</u>														
Send Report via <input checked="" type="checkbox"/> e-mail (address) <u>peeblesb@saic.com</u>		<input type="checkbox"/> Mail <input type="checkbox"/> Telephone <input type="checkbox"/> Fax (fax #) _____																
* Matrix Types: Soil/Solid (S), Sludge, Oil, Wipe, Drinking Water (DW), Groundwater (GW), Surface Water (SW), Waste Water (WW), Other (specify)																		
Client Sample ID	Matrix*	Grab	Composite	Filtered	Date Collected	Time Collected	No. of Containers	Requested Analysis								Comments		
								TCLP	Volatiles	SVOC	* Metals							
COW-6	WW	✓			9/2/09	12:02	9	✓	✓	✓	✓							* Total Metals
Possible Hazard Identification		<input type="checkbox"/> Hazardous <input checked="" type="checkbox"/> Non-Hazardous		<input type="checkbox"/> Radioactive		Sample Disposition		<input checked="" type="checkbox"/> Dispose as appropriate		<input type="checkbox"/> Return		<input type="checkbox"/> Archive						
Number of Containers: _____		Relinquished By (signature) <u>[Signature]</u>		Printed Name/Affiliation <u>Brandon Peebles</u>		Date/Time <u>9/3/09 13:59 (MT)</u>		Received By (signature) _____		Printed Name/Affiliation _____								
Cooler Number: _____		Relinquished By (signature) _____		Printed Name/Affiliation _____		Date/Time _____		Received By (signature) _____		Printed Name/Affiliation _____								
Temp upon receipt (°C): _____		Relinquished By (signature) _____		Printed Name/Affiliation _____		Date/Time _____		Received for Lab By (signature) _____		Printed Name/Affiliation _____								
Sample Received on Ice or Refrigerated from Client: Yes / No		Relinquished By (signature) _____		Printed Name/Affiliation _____		Date/Time _____		Received for Lab By (signature) _____		Printed Name/Affiliation _____								

** Samples May Analyze to add 1 QC Blank as **

WHITE - LAB

YELLOW - REPORT

PINK - CLIENT RECEIPT

Page 1 2

APPENDIX F

LAB RESULTS

QUALIFIER	DESCRIPTION																
#	QC not in acceptance limits.																
A2	Results expressed as mg/L TCLP extract after performing total analysis of the sample and adjusting the result to reflect the 20 times dilution in the TCLP extraction procedure.																
B	Analyte is found in method blank.																
D	Sample Diluted																
E3	Concentration estimated due to internal standard recoveries out of acceptance limits.																
L2	The LCS recovery was above the laboratory acceptance limits. The target analyte concentration was below the reporting limit. No negative impact on the data																
L3	The LCS recovery was below the laboratory acceptance limits. The reported result is estimated.																
M1	The matrix spike recovery was out of acceptance limits. The post digestion spike recovery was acceptable.																
ND	Not Detected																
R3	Sample Duplicate RPD was out of acceptance limits. The result concentration was within 5 times the reporting limit and the difference was less than the reporting limit.																
S2	Surrogate recovery was above laboratory acceptance limits. Reported data is estimated.																
S3	Surrogate recovery was below laboratory acceptance limits. Re-extraction/re-analysis confirms low recovery due to matrix interference.																
S4	Surrogate recovery was below laboratory acceptance limits. Reported data is estimated.																
U	Sample concentration is less than the MDL.																
V1	CCV recovery was above acceptance limits. The concentration was below the reporting limit.																
V6	CCV recovery was below acceptance limits. The reported result is estimated.																
Z10	Continuing Calibration Blank (CCB) contained a detectable amount of target analyte, sample concentration was less than the reporting limit, no impact on data																
Z10a	Method Blank contained 0.030mg/L Iron.																

COLSTRIP TCLP DATA																															
Field Sample ID	TCLP Regulatory Criteria	COW-1			COW-10			COW-2			COW-3			COW-4			COW-5			COW-6			COW-7			COW-8			COS-1		
Lab Sample ID		0910255-01			0910255-11			0910255-02			0910255-03			0910255-04			0910255-05			0910255-06			0910255-07			0910255-09			0910255-08		
Matrix		Water			Water			Water			Water			Water			Water			Water			Water			Solid					
Sample Date		09/02/2009 09:50:00			09/02/2009 16:16:00			09/02/2009 10:13:00			09/02/2009 10:41:00			09/02/2009 11:03:00			09/02/2009 11:49:00			09/02/2009 12:02:00			09/02/2009 12:19:00			09/02/2009 15:09:00			09/02/2009 14:14:00		
Units		mg/l	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q	DVQ	mg/l	Lab Q
Arsenic	5	ND			ND			0.12	B	J	ND			0.12	B	J	ND			ND			ND			ND			ND		
Barium	100	ND			ND			ND			ND			ND			ND			ND			ND			ND			ND		
Cadmium	1	ND			ND			ND			ND			ND			ND			ND			ND			ND			ND		
Chromium	5	ND			ND			ND			ND			ND			ND			ND			ND			ND			ND		
Lead	5	ND			ND			ND			ND			ND			ND			ND			ND			ND			ND		
Selenium	1	ND			ND			ND			ND			ND			ND			ND			ND			ND			ND		
Silver	5	ND		J	ND		J	ND		J	ND		J	ND		J	ND		J	ND		J	ND		J	ND		J	ND		J
Mercury	0.2	ND			ND			ND			ND			ND			ND			ND			ND			ND			ND	D	
1,1,2,2-Tetrachloroethylene	0.07	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
1,1,2-Trichloroethylene	0.5	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
1,1-Dichloroethylene	0.7	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
1,2-Dichloroethane	0.5	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
Benzene	0.5	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
Carbon Tetrachloride	0.5	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
Chlorobenzene	100	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
Chloroform	6	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		0.0055	A2		ND	A2, U		ND	A2, U, D	
Methyl Ethyl Ketone (2-Butanone)	200	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
Vinyl chloride	0.2	ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U		ND	A2, U, D	
1,4-Dichlorobenzene	7.5	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	L3, U	J	ND	U	J
2,4,5-Trichlorophenol	400	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
2,4,6-Trichlorophenol	2	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
2,4-Dinitrotoluene	0.13	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
2-Methylphenol	200	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
4-Methylphenol, 3-Methylphenol	200	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Hexachlorobenzene	0.13	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Hexachlorobutadiene	0.5	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Hexachloroethane	3	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Nitrobenzene	2	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Pentachlorophenol	100	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Pyridine	5	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J
Total Cresols	200	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J

COLSTRIP VOC DATA																							
	Aqueous Samples																						
Field Sample ID	COW-10				COW-5				COW-6				COW-7				COW-8				COW-9 (TB)		
Lab Sample ID	09I0255-11				09I0255-05				09I0255-06				09I0255-07				09I0255-09				09I0255-10		
Matrix	Water				Water				Water				Water				Water				Water		
Sample Date	09/02/2009 16:16:00				09/02/2009 11:49:00				09/02/2009 12:02:00				09/02/2009 12:19:00				09/02/2009 15:09:00				09/02/2009 16:36:00		
Units	ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ
1,1,1,2-Tetrachloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1,1-Trichloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1,2,2-Tetrachloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1,2,2-Tetrachloroethylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1,2-Trichloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1,2-Trichloroethylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1-Dichloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1-Dichloroethylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,1-Dichloropropylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2,3-Trichlorobenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2,3-Trichloropropane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2,4-Trimethylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2-Dibromo-3-chloropropane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2-Dibromoethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2-Dichloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,2-Dichloropropane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,3,5-Trimethylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
1,3-Dichloropropane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
2,2-Dichloropropane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
2-Chloroethyl Vinyl Ether	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
2-Chlorotoluene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
4-Chlorotoluene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
4-Isopropyltoluene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Acetone	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Acetonitrile	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Acrolein	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Acrylonitrile	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Allyl Chloride (3-Chloropropylene)	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Benzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Bromobenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Bromochloromethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Bromodichloromethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Bromoform	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Bromomethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Butylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Carbon disulfide	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Carbon Tetrachloride	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Chlorobenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	
Chloroethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D			ND	U, D	

COLSTRIP VOC DATA																
	Aqueous Samples															
Field Sample ID	COW-10				COW-5				COW-6				COW-7			
Lab Sample ID	0910255-11				0910255-05				0910255-08				0910255-07			
Matrix	Water				Water				Water				Water			
Sample Date	09/02/2009 16:16:00				09/02/2009 11:49:00				09/02/2009 12:02:00				09/02/2009 12:19:00			
Units	ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ		ug/l	Lab Q	DVQ	
Chloroform	ND	U, D			ND	U, D			ND	U, D			110	D		
Chloromethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Chloroprene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
cis-1,2-Dichloroethylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
cis-1,3-Dichloropropylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Dibromochloromethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Dibromomethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Dichlorodifluoromethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Ethyl Methacrylate	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Ethylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Iodomethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Isopropylbenzene (Cumene)	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
m,p-Xylenes	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methacrylonitrile	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methyl Butyl Ketone (2-Hexanone)	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methyl Ethyl Ketone (2-Butanone)	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methyl Isobutyl Ketone	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methyl Methacrylate	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methylene Chloride	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Methyl-tert-Butyl Ether	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
o-Xylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Propionitrile (Ethyl Cyanide)	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Propylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
sec-Butylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Styrene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
tert-Butylbenzene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Toluene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Total Xylenes	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
trans-1,2-Dichloroethylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
trans-1,3-Dichloropropylene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
trans-1,4-Dichloro-2-butene	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Trichlorofluoromethane	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Vinyl acetate	ND	U, D			ND	U, D			ND	U, D			ND	U, D		
Vinyl chloride	ND	U, D			ND	U, D			ND	U, D			ND	U, D		

COLSTRIP SVOC DATA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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COLSTRIP SVOC DATA			Aqueous Samples																		Soil Samples																	
Field Sample ID	COW-1			COW-10			COW-2			COW-3			COW-4			COW-5			COW-6			COW-7			COW-8			COS-1										
Lab Sample ID	0910255-01			0910255-11			0910255-02			0910255-03			0910255-04			0910255-05			0910255-06			0910255-07			0910255-09			0910255-08										
Matrix	Water			Water			Water			Water			Water			Water			Water			Water			Water			Solid										
Sample Date	09/02/2009 09:50:00			09/02/2009 16:16:00			09/02/2009 10:13:00			09/02/2009 10:41:00			09/02/2009 11:03:00			09/02/2009 11:49:00			09/02/2009 12:02:00			09/02/2009 12:19:00			09/02/2009 15:09:00			09/02/2009 14:14:00										
Units	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/l	Lab Q	DVQ	ug/kg	Lab Q	DVQ								
Acenaphthene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Acenaphthylene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Aniline	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Anthracene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Benz(a)anthracene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	E3, U	J								
Benztidine	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	E3, U	J								
Benzo[a]pyrene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Benzo[b]fluoranthene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Benzo[g,h,i]perylene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Benzo[k]fluoranthene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Benzoic Acid	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Benzyl alcohol	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
bis(2-Chloroethoxy)methane	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Bis(2-Chloroethyl)ether	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Bis(2-chloroisopropyl)ether	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Bis(2-Ethylhexyl)phthalate	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		10000	E3	J								
Butylbenzylphthalate	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	E3, U	J								
Carbazole	ND	U	R	ND	U	R	ND	U	R	ND	U	R	ND	U	R	ND	U	R	ND	U	R	ND	U	R	ND	U	R	ND	U	R								
Chrysene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	E3, U	J								
Dibenz[a,h]anthracene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Dibenzofuran	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Diethylphthalate	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Dimethylphthalate	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Di-n-butylphthalate	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Di-n-octylphthalate	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Fluoranthene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Fluorene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Hexachlorobenzene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Hexachlorobutadiene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Hexachlorocyclopentadiene	ND	U	J	ND	U	J	ND	U	R	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J								
Hexachloroethane	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Indeno[1,2,3-cd]pyrene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	E3, U		ND	E3, U		ND	U		ND	E3, U		ND	E3, U	J								
Isophorone	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Naphthalene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Nitrobenzene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
N-Nitrosodimethylamine	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
N-Nitroso-di-n-propylamine	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
N-Nitrosodiphenylamine	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Pentachlorophenol	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Phenanthrene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Phenol	ND	U		ND	U	J	ND	S4, U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	U	J								
Pyrene	ND	U		ND	U	J	ND	U	R	ND	U		ND	U		ND	U		ND	U		ND	U		ND	U		ND	E3, U	J								
Pyridine	ND	U	J	ND	U	J	ND	S4, U	R	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J	ND	U	J								

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